

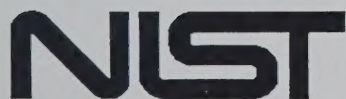
**A GUIDE TO BOARD AND CARE FIRE  
SAFETY REQUIREMENTS IN THE 1991  
EDITION OF THE LIFE SAFETY CODE**

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**United States Department of Commerce  
Technology Administration  
National Institute of Standards and Technology**



# A GUIDE TO BOARD AND CARE FIRE SAFETY REQUIREMENTS IN THE 1991 EDITION OF THE LIFE SAFETY CODE

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July 1993



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**U.S. Department of Commerce**  
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### Notice

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The statements and conclusions contained in this report are those of the authors and do not necessarily reflect the views of the National Institute of Standards and Technology.



# A Guide to Board and Care Fire Safety Requirements in the 1991 Edition of the *Life Safety Code*

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A Guide to Board and Care  
Fire Safety Requirements  
in the 1991 Edition of the  
Life Safety Code

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# Acknowledgements

This guide was written as part of a larger project with the overall goal of promoting a high degree of fire safety in board and care homes without unnecessary expense or interference with the program objectives of the homes. Funding for the project was provided by six Federal agencies: in the Department of Health and Human Services—the Administration on Developmental Disabilities, the Administration on Aging, the Health Care Financing Administration, the National Institute of Mental Health, and the Social Security Administration; and in the Department of Education—the National Institute on Disability and Rehabilitation Research. The project was directed by George Mason University and monitored by the Building and Fire Research Laboratory of the National Institute of Standards and Technology.

The guide results in large part from several years of interactions with people whose contributions are too numerous to mention. However, a few people assisted directly with the development of this guide, and their contributions can be gratefully acknowledged. Bernard (Bud) Levin and Roseanne Paulsen, my colleagues in the project, contributed greatly at every stage of writing the guide, from initial concept through final editing. Without their contributions, the final product would have suffered immeasurably. The following persons contributed in very substantive ways by reviewing portions or entire drafts of the guide and by discussing substantive issues of interpretation or public policy—Phil Jose, Jim Lathrop, Irving Mande, Harold (Bud) Nelson, Joni Fritz, and Ken Isman.

The author is solely responsible for any errors and for the interpretations of *Life Safety Code* requirements contained herein.



# Preface

simplicity, accuracy, and  
brevity are mutually  
exclusive objectives

The initial plan for writing this guide was to create a brief, accurate, and simple explanation of the board and care requirements in the *Life Safety Code*. It soon became apparent that fully accomplishing all of these objectives was impossible. No matter how concise the writing, a discussion that was simple and brief could not be accurate—the requirements are that complicated. Instead, the final version sacrifices brevity in favor of accuracy. Still, the reader will hopefully find that the objectives of simplicity and brevity are preserved in particular discussions of separate topics.

this guide **interprets**  
*Code* requirements

This guide is an accessory to the *Life Safety Code*, not a substitute. There are certain requirements that can be reasonably interpreted in ways that differ from the descriptions offered in this guide. The reader is cautioned to read the exact wording of the *Code* and reach his or her own conclusions. To this end, section numbers in the 1991 edition of the *Code* are referenced throughout the guide.

how to use this guide

A cover-to-cover reading of the guide should provide a complete overview of the requirements. However, many users lead very busy lives, and may consult the guide only when information is needed about a single topic. For this reason, the guide is formatted with many headings, and cross-referenced and indexed to help readers quickly locate the information of interest.

terminology

A few conventions are used to make the guide more readable. Relevant sections numbers in the **1991** Edition are referenced throughout using brackets and a different typeface as shown here: [22/23-4.3.5] The use of “22/23” indicates that the relevant section number



is the same in both Chapter 22 (new facilities) and Chapter 23 (existing facilities) of the *Life Safety Code*.

coverage excludes large  
impractical board  
and care homes

The contents of this guide are incomplete. Most important is the omission of requirements for large board and care facilities that are impractical to evacuate. These requirements are the same as those used for limited care health care facilities, and are covered in Chapters 12 and 13 of the *Life Safety Code*. To include those requirements would add to the already considerable length of this guide. Also, operators of such facilities are generally fewer in number, larger in resources, and better equipped to handle regulatory matters than other board and care operators.

overview of the contents

Chapter 1 provides a brief historical background to the requirements. Persons who are puzzled by the logic of having such complex requirements will find this chapter interesting. Chapter 2 provides an overview of the organization of the *Life Safety Code* document, as well as information about the procedures for its revision, and its adoption and enforcement by regulatory authorities. Chapter 3 covers the most innovative and least understood part of the requirements, evacuation capability. If nothing else, I hope that this guide facilitates a much improved appreciation and understanding of this important topic. Chapters 4 through 8 each deal with an important fire safety objective that underlies the requirements. I believe that an appreciation for the reasons for the requirements will both lead to more rational enforcement and a greater willingness to comply with the requirements. Chapter 9 covers the Fire Safety Evaluation System for Board and Care Facilities. This is an alternative procedure for determining whether a facility meets the requirements of the *Life Safety Code*.

In addition to the main body of the guide, there are two appendices that provide useful, if somewhat tangential, information. Appendix A concerns the problem of regulating fire safety in homes that differ from board and care homes primarily by their smaller size—there are fewer than four residents. Appendix B briefly offers some advice about how to plan for a fire emergency in a manner that is consistent with and reinforces the requirements in the *Life Safety Code*.

# Forward

The *Life Safety Code* is a large document written in a special precise style to minimize ambiguity. It is very difficult for the layman to understand the terminology and the details of the *Life Safety Code*. As a result, most providers do not understand the *Code* and blindly follow the recommendations or demands of the regulatory agency.

This guide is not designed to make experts of its readers. Its purpose is to help providers and others understand the *Code*, both the actual requirements and the reasons for these requirements. This improved understanding should be of value in communicating with architects and regulators and in developing fire safety plans. Many providers will be pleased to better understand an aspect of their operation that costs so much money and that might otherwise affect the operation of their Board and Care Home.

The *Code* is difficult for a layman to learn and to understand. The author has worked diligently to translate code language into text that is understandable to the average provider. The author is to be commended for writing a document that can make this complicated code understandable to a layman who is willing to work hard to learn it. (It is anticipated that professionals will also find the guide to be useful.) The author is also to be commended for developing a format that makes it relatively easy to quickly find desired information so that the guide can be a useful reference document.

Bernard Levin



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## Background

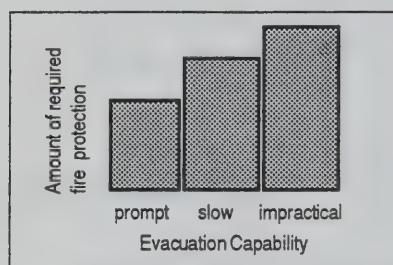
### What's Special about *Life Safety Code* Board and Care Requirements

the *Life Safety Code*'s board and care provisions set different requirements for nine types of board and care homes

The requirements for board and care homes in the *Life Safety Code* are unique. Other model codes generally use the same requirements for different types of board and care homes. On the other hand, the *Life Safety Code* deals with the extreme variety of board and care homes by using different requirements for different types of homes—almost like having nine different codes. Different sections of the *Life Safety Code*'s board and care chapters are applied according to the size and type of the facility and how easily the occupants can be evacuated as a group (evacuation capability). The classification of facilities is shown in the following table.

size \ type of board and care home			
evacuation capability	small prompt	large prompt	prompt in an apartment
	small slow	large slow	slow in an apartment
	small impractical	large impractical	impractical in an apartment

fire safety requirements  
increase as evacuation  
capability becomes  
less favorable



Unlike more traditional approaches, *Life Safety Code* requirements for board and care homes are based on the ability of residents and staff to evacuate as a group. Facilities are assigned one of three levels of “evacuation capability” — “prompt,” “slow,” or “impractical.” As long as the assigned level of evacuation capability is maintained, any combination of persons with disabilities is allowed. Any one person who needs assistance to evacuate is not necessarily restricted from the program that best serves his or her needs. (For detailed information, see Chapter 3 of this guide.)

Facilities can qualify for an evacuation capability level using any approach accepted by the regulatory authority. The *Life Safety Code* suggests two possible methods that are frequently used:

☞ **Records of fire drill times.** Chapter 31 of the *Life Safety Code* requires board and care homes to run fire drills anyway. Regulators can audit the times, if they wish, by observing the drills. The *Code* recommends maximum time limits to evacuate the facility (or reach a point-of-safety) for each level.

☞ **Evacuation Capability Determination (ECD).** This method provides a conservative and detailed measure of evacuation capability by calculating a score based on the assistance needs of residents and the availability of staff to provide the needed assistance.

fire safety requirements  
differ for different  
types of buildings

The *Life Safety Code* requirements recognize that different sets of requirements are needed depending on the type of building that houses a board and care facility. Separate sets of requirements are available for small homes (up to 16 residents), large homes (more than 16 residents), and small homes located in an apartment building. Requirements for large facilities are generally more stringent than for small facilities. Apartment requirements govern the building surrounding the facility, while the unit itself must meet the requirements for a small facility.



a fire safety  
evaluation system

The *Code* recognizes that there are different ways to achieve the same high level of fire safety in the same building. The Fire Safety Evaluation System (FSES) is an optional method that will determine which combinations of fire safety features provide a level of protection that is equivalent to the specific features mandated in the *Code*. The FSES helps operators find cost-effective solutions to their design problems—an especially great help when existing buildings are used for board and care homes. Regulators can feel assured that there is a technical basis for their flexibility. (For more detailed information, see Chapter 9.)

## The Traditional Regulatory Approach Used for Board and Care Homes

This section examines the unusual variety of board and care homes, and explains why some aspects of the traditional approaches to writing codes are ill-suited to deal with that variety.

### Unequaled Variety of Board and Care Facilities

Traditional code approaches are largely based on the assumption that all buildings in a single occupancy classification are similar enough so that the same basic code (with minor variations) can be applied to all of them. The board and care occupancy is different, because the homes are so varied that regulators can't make valid generalizations about them. There are three factors that make board and care homes far more variable than other types of occupancies.

building variety

Board and care homes are found in every type and size of residential and institutional building. There are converted nursing homes and custom-built retirement homes with 300 residents. There are also small group homes where just a few residents live in what was, or closely resembles, a single family house or an ordinary apartment.

resident variety	With training, mildly retarded residents or teenagers from dysfunctional homes can be more capable of quickly evacuating than the general public. On the other hand, many severely retarded or multiply-handicapped persons are unable to participate in their own protection.
program variety	Goals and funding levels vary widely. Some programs require intensive treatment regimens, while others maximize their clients' independence. For some programs, funding levels are based on the level of treatment. But for many board and care homes, public funding is meager or nonexistent, and every dollar diverted to fire protection means fewer services for residents.

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### Problems Caused by Traditional Code Approaches

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the traditional “worst case” approach	Traditional codes tend to base their requirements on the least favorable situation. This works well in hospitals where it is reasonable to assume most patients cannot move themselves from their beds—at least on some wards. But when this “worst case” approach is applied to board and care homes, regulators, operators and funding agencies are forced to make difficult and counterproductive choices.
counterproductive choices for regulators	<p>Using the traditional “worst case” approach, regulators can find themselves choosing between two unattractive alternatives:</p> <ul style="list-style-type: none"><li>☞ Regulators can decide to regulate all board and care homes based on the least capable residents. This can lead to fire safety requirements for board and care homes that are at least as stringent as those used for hospitals. Very stringent requirements tend to encourage the construction of large facilities as a means to offset the expense of building. Where regulators enforce health care codes for board and care homes, some fire safety requirements tend to give the buildings an institutional appearance.</li><li>☞ Regulators can decide that the only residents permitted to live in “residential” facilities must be “capable of self-preservation” or “ambulatory” or “mobile.” (See page 3-2 of this guide.) They can</li></ul>

then enforce requirements for residential occupancies (e.g., single-family houses and lodging houses). But other residents with more severe disabilities are forced to remain in institutional settings where fire safety requirements for health care homes are enforced.

counterproductive  
choices for operators

Using a traditional code approach can force operators to make unnecessary economic and programmatic choices. They can operate their facility in an institutional-type setting where they can serve clients with any level of disability; or they can restrict their board and care homes to only those clients who are fully capable of protecting themselves during a fire.

counterproductive  
choices for agencies

Agencies trying to run effective programs can have difficulty placing clients in the types of homes and programs that best serve their needs. Clients may be unable to obtain the type of training that would allow them to advance to their highest levels of capability. They are restricted from settings that provide them with the highest possible quality of life.

This situation is not a “what if” analysis of government policy. It was the prevailing situation a few years ago. (And remains so in some areas.) Clients with disabilities found themselves unable to escape from institutional settings and gain access to quality residential settings. Residential settings that provided very high levels of protection were so costly that many persons couldn’t afford them and were forced to live in undesirable settings such as single-room occupancies (cheap residential hotels) where personal services were unavailable.

## A History of Board and Care Provisions in the *Life Safety Code*

The *Code*’s board and care requirements were developed as a better approach to coping with the variety of board and care homes. The resulting requirements produced an unusually flexible (and therefore complex) code that still evokes cheers and moans depend-



ing on people's background and beliefs about residential care and fire safety. The remainder of this chapter traces the development of these requirements.

## Tragic Fires Drew Attention to the Board and Care Fire Problem

In the late 1970's and early 1980's, a rash of fires in board and care homes drew attention to a serious problem. In only eight fires, 120 elderly and impaired residents died. Many other smaller fires, largely undocumented, probably killed many additional persons one and two at a time.

How did this happen? Under the pressures of deinstitutionalization, the numbers of board and care homes proliferated rapidly. Local and state authorities lacked the regulatory tools they needed to deal with these new facilities without causing the types of problems discussed in the previous section.

### Congressional hearings

The fires did not pass unnoticed. Congressional hearings were conducted in April of 1979 by the House of Representative's Subcommittee on Health and Long-term Care, Select Committee on Aging. The hearing documented the hazardous environments to which board and care residents were often exposed, and applied pressure to governmental agencies to improve the situation.

## National Bureau of Standards Funded to Develop an Improved Standard

Meanwhile, the U.S. Department of Health, Education and Welfare (now the Department of Health and Human Services) gave funds to the National Bureau of Standards' (now the National Institute of Standards and Technology) Center for Fire Research to develop a model code specifically for board and care. This project developed the predecessor that evolved into the board and care requirements in the *Life Safety Code*.

### different requirements for different levels of evacuation capability

After some initial investigation, the Center for Fire Research realized that it needed an entirely new approach to cope with the wide assortment of board and care homes. While variety in buildings was familiar territory, the differences in the disabilities and abilities



of clients was a new type of problem. They decided that different requirements should be imposed depending on how difficult it would be to evacuate the building during a fire. The lower the “evacuation capability” of a facility, the more stringent the requirements that should be imposed on it.

a constant overall level of  
fire safety for all  
board and care homes

By requiring more stringent requirements as board and care homes faced more difficult evacuation problems, the requirements would maintain a constant level of overall fire safety across different types of facilities. Stated differently, less stringent (costly) requirements could be used for some board and care homes (smaller and more easily evacuated).

There remained a question of how much fire safety was appropriate. The decision was made that the requirements should impose an overall level roughly equivalent to that used for other comparable occupancies. At least three anchor-points were available in chapters in the *Life Safety Code*: (1) lodging houses for small facilities that could be quickly evacuated; (2) hotels for large facilities that could be quickly evacuated; and (3) health care facilities for both small and large facilities where evacuation was not practical. (The anchor point for small board and care homes where evacuation was not practical had to be adapted from health care requirements, taking into consideration the different layouts typical of small residential buildings.)

### How Professional Judgment Was Used to Develop the NBS Board and Care Requirements

The professional judgment of outside experts was used by project staff at the National Bureau of Standards throughout the development of the NBS model board and care requirements. The project staff presented preliminary versions of parts of the requirements to panels of experts who then commented on the version and suggested changes. Resulting changes were then returned in an iterative fashion to the panels for further suggestions. Particular attention was paid to the numerical scores on both the FSES and the Evacuation Capability Determination method. The process lasted about four years and wasn't completed until there was a general consensus among the members of the panels and the NBS project staff.

Two principal peer consulting groups were used — one examining human behavior aspects (primarily the Evacuation Capability Determination method) and the other examining fire protection engineering aspects (primarily the FSES). Towards the completion of the project, a new panel was recruited to review the calibration of levels of evacuation capability to the FSES. For example, this panel set maximum fire drill time limits and E-scores (produced by the Evacuation Capability Determination method) that should be allowed in small group homes that are “slow” to evacuate, as well as time limits for the other types of board and care homes.

### A Fire Safety Evaluation System

The Center for Fire Research already had successfully designed a Fire Safety Evaluation System (FSES) for health care facilities, and believed that a similar system would be useful for the board and care occupancy. The FSES allows different combinations of fire protection features, as long as they provide a level of protection that is equivalent to that provided by the fixed requirements in the *Code*.

some states jump the gun

Work was completed on the NBS/CFR proposal and published as a technical report in 1983. A few states felt that they immediately needed an appropriate code for board and care homes. Because they trusted the technical competence and the process used to develop the requirements, these states adopted the requirements as described in the technical report, and in a few instances, used parts of earlier versions that differed significantly from the final version.

NBS report incorporated into *Life Safety Code* for the 1985 edition

Even before its final publication, the model requirements had been submitted to NFPA technical committees for inclusion as Chapter 21 in the 1985 edition of the *Life Safety Code* (Chapters 22 and 23 in the 1991 edition). As described in Chapter 2, committees comprised of experts with diverse backgrounds and inter-

### How the NBS Standard was Field Tested

The National Bureau of Standards' Center for Fire Research conducted an extensive field test of its model board and care fire safety requirements. Data were collected for 151 board and care homes in different locations throughout the United States. The National Bureau of Standards conducted a short training session for the same types of regulators who would have to use the requirements. They wanted to not only find out whether the requirements provided valid results, but to also find out whether the participants had difficulty in using the system.

Regulators who rated buildings were asked whether each building provided adequate safety without knowing whether it passed the requirements. Facilities that failed the requirements were generally judged inadequate by the inspectors. Facilities that passed were generally judged as having an acceptable level of safety. However, based on this test, a few adjustments were made to the FSES point values for sprinklers, smoke detectors, and separation of sleeping rooms.

The field teams also observed and timed fire drills. In only five out of 81 board and care homes were the fire drill times slower than might be expected from E-scores. (E-scores are calculated using the Evacuation Capability Determination method.) A close examination of these facilities revealed that none of the cases threatened the validity of the E-scores. For example, three of the board and care homes had very long fire drill times because they had never conducted fire drills. The E-scores were based on how well the residents were expected to do after they received training, which accounts for the discrepancy. In general, Evacuation Capability Determination was shown to provide a very conservative measure of evacuation capability. (See Chapter 3 for information about Evacuation Capability Determination and Chapter 9 for information about the Fire Safety Evaluation System.)

The field test provided evidence that the requirements gave generally valid results. It also convinced some of the field test participants who were initially skeptical that the model code was easier to use than its appearance had led them to believe.

ests write the *Life Safety Code*. The *Life Safety Code* is the most widely used model fire safety code, and thus, the logical starting point to rationalize fire safety requirements for board and care.





# Overview of the Contents and Administration of the *Code*

## Four Parts to the *Life Safety Code*

The *Life Safety Code* (and related material) is organized into four major parts as follows:

### 1. core chapters

Chapters 1 through 7 detail the general specifications of the *Code*. For example, Chapter 5 (means of egress) provides the exact measurements and layouts that determine whether exit doors, corridors, stairwells, etc. conform to *Code* requirements. Similarly, Chapter 7 covers alarm and sprinkler systems, other building services, and fire protection equipment. With some exceptions, the specifications in these “core” chapters only apply when they are referenced by an occupancy chapter. (These chapters are also called “base” or “fundamental” chapters)

### 2. occupancy chapters

Each of the occupancy chapters covers a specific type of building use. (The *Life Safety Code* defines “occupancy” as “the purpose for which a building or portion thereof is used or intended to be used.”) Many occupancies have separate chapters for new and existing facilities. For example, in the 1991 edition, chapters 22 and 23 cover new and existing board and care

Code officials commonly refer to requirements by their section and chapter numbers, but this can be misleading, because revisions can change these numbers. For example, Chapter 21 covered the board and care requirements in the 1985 and 1988 editions, but the requirements are now found in Chapters 22 and 23 of the 1991 edition.

### 3. operating features

### 4. explanations and optional approaches

facilities, respectively. (Note that a change of occupancy generally means that the facility is considered to be new—even though the building remains the same. See page 9-4 of this guide.)

Occupancy chapters refer to the requirements in the core chapters. For example, whenever an “exit” is required, the exit must conform to requirements in Chapter 5 of the *Life Safety Code*.

This section deals with the requirements for the day-to-day operation of facilities. These requirements for all occupancies are collected in a single chapter. (In recent editions, the requirements specific to board and care are in Section 31-7.) Typical operating feature provisions cover the number and type of fire exit drills, details of the fire emergency plan, and requirements for flammability standards for mattresses.

In addition to the mandatory provision in the *Code*, explanations, recommendations, and optional approaches are also provided. Some of this material is of great importance. For example, all the information about alternative approaches to establishing evacuation capability is found in these sections.

Appendix A contains important explanatory information. Each section in Appendix A explains the section in the main body of the code with the same number. For example, section A-14-1.2 explains material in section 14-1.2. While reading the *Code*, sections that have explanatory materials in Appendix A are marked with an asterisk [\*] as in 14-1.2\*.

Prior to the 1988 edition, there were several appendices that covered optional approaches. Starting with the 1988 edition of the *Life Safety Code*, these optional approaches were moved to a separate document called NFPA 101M, *Alternative Approaches to Life Safety*. Two of these approaches were developed specifically for board and care:

- ☞ The Fire Safety Evaluation System for Board and Care Homes (Appendix G in the 1985 edition; Chapter 6 in the 1988 and 1992 editions of NFPA 101M.) (Covered in chapter 9 of this guide.)

- ☞ Evacuation Capability Determination (Appendix F in the 1985 edition; Chapter 5 in the 1988 and 1992 editions of NFPA 101M.) (Covered in chapter 3 of this guide.)

## Organization of the Board and Care Requirements

### The *Handbook* is More Useful

The NFPA publishes the *Life Safety Code* in two different formats, the *Code* by itself in “pamphlet” format, and an annotated hardcover version, the *Life Safety Code Handbook*. If you buy only one, consider spending the extra money to purchase the *Handbook*. Although large and bulky, it contains an easier to use format and a great deal of helpful explanatory material. Also included in the latest edition are several supplementary chapters with detailed discussions of topics like fire alarm systems and sprinkler systems. Either the pamphlet or handbook versions can be ordered from NFPA by phoning 1-800-344-3555.

The chapters on board and care are also broken down into parts. You will find it easier to locate relevant provisions if you understand this organization. Note that the list below refers to the 1991 edition. The same organization applies to the prior editions, but the section numbering is different reflecting the different chapter numbers. In the 1991 edition, requirements for new and existing facilities were separated into two chapters. For example, in prior editions, all general requirements were found in section 21-1 instead of in sections 22-1 and 23-1. (Chapter 22 covers new facilities; Chapter 23 covers existing facilities.)

- ☞ Sections 22-1 and 23-1 — General Requirements (including definitions)
- ☞ Sections 22-2 and 23-2 — Small Facilities (4 to 16 residents)
- ☞ Sections 22-3 and 23-3 — Large Facilities (17 or more residents)
- ☞ Sections 22-4 and 23-4 — Suitability of an Apartment Building to House a Board and Care Occupancy
- ☞ Section 31-7 — Operating Features of Board and Care Homes
- ☞ NFPA 101M, Chapter 5 — Evacuation Capability Determination
- ☞ NFPA 101M, Chapter 6 — Fire Safety Evaluation System for Board and Care Facilities



## What are “Board and Care Facilities?”

### The *Code* definition

The *Life Safety Code* definition of residential board and care occupancy reads as follows: “A building or part thereof that is used for lodging and boarding of *four or more residents*, not related by blood or marriage to the owners or operators for the purpose of providing *personal care* services.” (italics added)

### four or more residents

Facilities that serve fewer than four residents are not board and care facilities as defined by the *Code*. Adult foster care is a commonly applied term for these very small facilities. (See Appendix A for a discussion of foster care homes.)

### personal care

The *Code* defines “personal care” in part as “...protective care of residents who do not require chronic or convalescent medical or nursing care.” The definition goes on to list examples of personal care. It is important to understand that board and care facilities can provide medical care of a type that resembles that provided in a home by family members. However, there is recent interest in providing skilled nursing care in residential settings as part of the move to “assisted living” and “aging-in-place.” The apparent conflict can be resolved when regulatory authorities adopt the *Code* by explicitly allowing certain types of medical care.

### Some Other Names for Homes That May Fall Under the *Code*’s Definition of Board and Care Homes

half-way house	congregate living facility
group home	intermediate care facility for the mentally retarded
retirement home	residential treatment center
assisted living facility	personal care home

## Types of Codes and Standards

### Model Codes and Codes Adopted by Regulatory Authorities

model codes must be  
adopted before they  
are enforced

The *Life Safety Code* is a model code. Before a model code can be enforced, it must be adopted by a regulatory authority that has some legal jurisdiction. Agencies may simply “reference” a code, which means that the regulation states that the particular model code is now part of the regulation and is enforceable. However, regulatory authorities can and often do modify model codes. They can make changes of which you may or may not approve. (See page 2-11 for information about participating in the processes of writing and adopting codes.)

Model codes, including the *Life Safety Code*, are sometimes used voluntarily as a means to provide a higher level of protection than regulations require and to help protect against litigation.

organizations that  
publish codes

Organizations other than the National Fire Protection Association also publish model codes. For example, there are three organizations that publish prominent building and fire codes. The International Conference of Building Officials (ICBO) publishes the *Uniform Building Code* and the *Uniform Fire Code*. The Building Officials and Code Administrators International (BOCA) publishes the *BOCA National Building Code* and the *BOCA National Fire Prevention Code*. The Southern Building Code Congress International (SBCCI) publishes the *Standard Building Code* and the *Standard Fire Prevention Code*.

### The Difference Between Codes and Standards

The terms “codes” and “standards” have somewhat different meanings. The “standard” is a set of exact specifications that describes how a specific type of hardware or building feature must be constructed and installed. For example, there is a standard that de-

scribes the parts and installation of residential sprinkler systems (NFPA 13R). A code specifies what hardware and building features are required, and where they must be installed. Codes typically “reference” standards to ensure that required hardware and building features are of a sufficiently high quality. As an example, the board and care chapters in the *Life Safety Code* reference NFPA 13R, the *Standard for the Installation of Sprinkler Systems for Residential Occupancies up to and Including Four Stories in Height*.

codes are sets of  
minimum requirements

Codes establish minimum requirements. Building owners sometimes exceed these requirements for added safety, to receive reduced insurance premiums, or to avoid future retrofits in response to anticipated new regulations. The decision to install residential sprinklers where they are not required is a prime example.

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## The Difference Between Building Codes and Fire Codes

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building codes

In general, building codes deal with the features that must be included in a building during its design and construction. The building is inspected and approved before it can be occupied, and the building must remain in compliance after it is occupied. Although fire safety is a major concern of building codes, requirements also deal with structural integrity, energy conservation, ventilation, and safety from other hazards. Building codes are generally enforced by local building departments.

fire codes

Fire codes concern operations within the building and the maintenance of building features after the building has been occupied. Fire codes deal with the types of hazards inside of buildings that may change without affecting compliance with the building code (for example, the storage of flammable chemicals and the maintenance of unobstructed exits). Fire codes are most typically enforced by fire department officials or fire marshals.



## The Difference Between the *Life Safety Code* and Fire Codes

The *Life Safety Code* differs considerably from other fire codes (for example, the *Uniform Fire Code*). It is concerned exclusively with preventing injuries and the loss of life from fires and explosions. Other fire codes are more oriented towards the prevention of property loss, especially in industrial settings. The *Life Safety Code* focuses on the protection of building occupants once a fire has been ignited, while other fire codes focus more on preventing a fire from igniting in the first place.

## Overlap Between the *Life Safety Code* and Building Codes

There is some overlap between the *Life Safety Code* and building codes. This has increased as the *Life Safety Code* includes more provisions governing construction. *Life Safety Code* technical committees have added some limited construction requirements in recognition that building construction is a vital part of fire safety systems. However, the *Life Safety Code* is not intended to replace a building code. Where both the *Life Safety Code* and a building code are used, the more stringent standard for construction will usually be enforced. (For a discussion of enforcement problems caused by inconsistencies between the *Life Safety Code* and building codes, see the discussion covering enforcement starting on page 2-12.)

## Efforts to Coordinate the Model Codes

Inconsistencies among model codes sometimes frustrate people who design, own, and operate buildings in different jurisdictions. Inconsistencies in occupancy definitions between the *Life Safety Code* and building codes are sometimes a problem. To help resolve inconsistencies, the Council of American Building Officials (CABO) has organized the Board for the Coordination of Model Codes (BCMC). This group has been very successful in coordinating requirements for atriums, health care occupancies, and means of egress. However, they have not tackled problems related to the board and care occupancy. Inconsistencies in the treatment of board and care are

sometimes troublesome, especially since most building codes lack a separate occupancy classification for board and care, instead forcing board and care facilities to be regulated as either residential or institutional occupancies.

## Administration of the *Life Safety Code*

### Committees that Write the *Life Safety Code*

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committees are  
comprised of volunteers

NFPA publishes a great many codes and standards (about 275) in addition to the *Life Safety Code*. The best known of these is the *National Electrical Code*.

The National Fire Protection Association publishes and coordinates the writing of the *Life Safety Code*. The actual work is done by committees comprised of volunteer members who vote to change NFPA codes and standards. The general public has the opportunity of suggesting changes to the committees and of commenting publicly on changes submitted by others. Membership in NFPA is not required.

When appointing persons to serve on committees, the NFPA attempts to establish a balance of interests. Members fall into one of two general categories:

- ☞ **Organizational representatives.** Many organizations have an interest in the contents of the *Code*. On the board and care technical committee, as on other committees, there is an attempt to achieve a balance of persons representing enforcers (e.g., Fire Marshals Association of North America, US Health Care Financing Administration), insurers (e.g., USF&G Insurance), manufacturers (e.g., the National Sprinkler Association), research/testing laboratories (e.g., Underwriters Laboratory) and users (e.g., the American Health Care Association, US Department of Veterans Affairs).
- ☞ **Special Experts.** These persons have special expertise that is useful to the committee. They can be affiliated with important organizations, but they are not representing those interests as such. For example, the author is such a member of the board and care technical committee.

## types of committees

There are a number of types of committees involved in writing the *Life Safety Code*.

☞ **Technical committees.** The board and care provisions in the *Life Safety Code* (including relevant sections of Chapter 31 , Operating Features) are the responsibility of a technical committee. Each type of occupancy has its own technical committee. There are also technical committees responsible for writing the core chapters of the *Code* that can be referenced by any occupancy chapter. For example, separate committees are responsible for “means of egress,” “fire protection features,” and “furnishings and content.” There are also technical committees responsible for standards that are referenced in the *Life Safety Code*. For example, there are technical committees that write the standards for “automatic sprinklers” (NFPA 13) and for “household fire warning equipment” (NFPA 74).

☞ **Coordinating committee.** A Coordinating Committee for the *Life Safety Code* is responsible for coordinating the activities of the technical committees, and for ensuring that there are not inconsistencies among the requirements developed by the technical committees.

**Organizations Currently Represented  
on the Board and Care Technical Committee**

National Association of Private Residential Resources	American Health Care Association
Fire Marshals Association of North America	Association of Residential Resources in Minnesota
National Electrical Manufacturers Association	Texas Dept. of Mental Health & Mental Retardation
US Health Care Financing Administration	California State Fire Marshal
National Fire Sprinkler Association	American Insurance Services Group
US Department of Veterans Affairs	New York State Dept. of Health
American Hotel and Motel Association	Underwriters Laboratories
American Association of Homes for the Aging	



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## Procedures for Revising the *Life Safety Code*

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three year cycles	The <i>Life Safety Code</i> has recently been revised on a three year cycle. For example, the revision of the 1988 <i>Code</i> became the 1991 edition. The next edition is expected to be issued in 1994.
proposals accepted from the public	Any person or organization may propose a change in the <i>Life Safety Code</i> . A deadline date for public proposals is published by NFPA, usually during the year following the date of the previous edition. Proposals affecting the board and care provisions are considered by the Technical Committee on Board and Care Facilities.
committees respond to proposals	Each and every proposal must be reviewed and either accepted or rejected by whatever committee is responsible for the section that would be changed. The committees' actions are published in the Technical Committee Reports (TCR), a copy of which can be obtained from the National Fire Protection Association.
public comments of committee actions	For a period of 60 days after the TCR is published, anyone can comment on and suggest changes to committee actions. Entirely new proposals are not accepted during the comment period.
committees respond to comments	The committees must respond to each and every comment. The committees' responses are published in the Technical Committee Documentation (TCD), a copy of which can be obtained from NFPA. The TCR and TCD together comprise the committees' recommendations for changes to the <i>Life Safety Code</i> .
NFPA membership votes on the recommended changes	At one of the NFPA meetings for members at large, the members vote to accept, amend, or reject revised standards and codes. They can also return reports to committees for further study.
Standards Council hears procedural complaints and issues TIAs	Even after the members vote, there is still a last resort—the Standards Council reviews the entire process and issues the new standard or code. The Standards Council is sort of a supreme court for the code writing process. It consists of prominent persons who have extensive experience in fire safety and the

code writing process. The Standards Council does not revise codes and standards; it only hears and judges procedural complaints. There is an important recent example. At the members' meeting when the last *Life Safety Code* revisions were approved, the membership approved far-reaching changes to the board and care provisions, removing any exceptions to smoke detection in both sleeping rooms and common spaces. In response to a complaint, the Standards Council restored the prior version. In effect, the Standards Council overruled the amendments made on the floor at the general members' meeting, explaining that these last-second changes lacked sufficient technical justification. This example is unusual in that complaints to the Standards Council do not ordinarily result in major changes to a standard or code.

The Standards Council also issues Tentative Interim Amendments (TIAs). The TIAs are recommended changes or additions to the *Code* that the Standards Council feels are sufficiently urgent that their publication should not wait for the next edition of a code or standard. The Standards Council issues TIAs only after soliciting comments from technical committees, the members of NFPA, and the public. The TIA will be considered for inclusion as part of the next cycle

### How to Participate in the Process of Writing and Adopting the *Code*

NFPA code writing procedures are intended to provide input from a broad range of interested parties. There are a number of ways to participate in the process. Membership in NFPA is not required, although members do automatically receive information that will make it easier to follow the process. Nonmembers will have to remember to request the needed information.

- ✓ **Request membership** on the board and care technical committee. (Membership on the committee is limited by number and type of representation.)
- ✓ **Make proposals to change the *Code*.** The technical committee must consider each and every proposal. Carefully reasoned and written substantiations can carry a lot of weight with the committee. Forms for submitting proposals are found in the back of the *Life Safety Code* and the *Life Safety Code Handbook*.
- ✓ **Comment on proposals to change the *Code*.** Even if your proposal is rejected, you can ask the committee to reconsider. You can also comment on committee actions taken on other proposals, either altering, encouraging, or discouraging the changes.
- ✓ **Make and comment on proposals to change the *Code* during the state or local adoption process.** The *Life Safety Code* is only a model code. It must be adopted by a regulatory authority, which can still make important changes. These regulatory authorities often conduct hearings during the adoption process. In the absence of hearings, you can lobby directly with agency officials and ask for help from locally elected officials.

of revisions. Meanwhile, TIAs are not part of the *Code* as such, and must be adopted independently by regulatory authorities.

## Enforcement Issues

### Regulatory and Enforcement Agencies May Differ

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The agency that adopts a code is not always the same agency that enforces it. In some states, local jurisdiction enforce state regulations. In other states, one agency (for example, the state fire marshals office) will enforce regulations adopted by another agency (for example, a state department of mental health). The US Health Care Financing Administration requires states to enforce the *Life Safety Code* board and care provisions for small Intermediate Care Facilities before they can receive Medicaid funds for those facilities. The US Department of Veterans Affairs does not enforce the *Life Safety Code*, but does inspect board and care homes for compliance before they are approved to provide care for veterans.

### Flexible Enforcement

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enforcement requires  
interpretation

Regulatory authorities have considerable flexibility in the manner in which they interpret and enforce codes. There are three basic situations where interpretation plays a major role.

- ☞ The enforcer can make different interpretations from a requirement that is ambiguously written.
- ☞ The enforcer may overlook things that he or she feels are inconsequential in a particular home, and
- ☞ The enforcer may correctly accept something that does not precisely meet a *Code* requirement, because he or she feels that it meets the intent of the *Code* and provides nearly equal protection.



granting exceptions for  
nonconforming hardware  
in existing facilities

The board and care provisions encourage code enforcers to be flexible by permitting nonconforming hardware in existing facilities when it is “acceptable to the authority having jurisdiction.” In truth, the authority having jurisdiction already has the right to accept nonconforming hardware. However, these exceptions encourage enforcers to consider whether the intent of a specific *Code* requirement is being met without compromising safety.

inconsistent enforcement

This same flexibility can cause problems for operators of board and care facilities. A common example is when a new inspector refuses to accept something that the prior inspector either overlooked or accepted as meeting the intent of the *Code*. Apart from ensuring the inspector has not made an error, the board and care operator may have little legal recourse. However, appealing to the code enforcer’s (or his or her supervisor’s) sense of fair play may bring the desired results.

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## Errors in Applying the *Code*

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The board and care provisions of the *Code* are difficult to use. The same flexibility that minimizes the cost of meeting the requirements of the *Code* adds to its complexity. Even inspectors who regularly use the *Code* need to regularly consult the written document. Many code enforcers are responsible for only a few board and care homes and seldom need to apply the provisions. Occasionally, they may apply the wrong sections, interpret them incorrectly, or make significant omissions. Much of the motivation behind writing this guide is to allow board and care operators the opportunity to review requirements imposed on their facilities. When errors are suspected, operators would do well to ask questions, ideally without accusing the inspector of making a mistake. If such tactful inquiries are not successful, and careful study indicates that a meaningful error has been made, then operators should not hesitate to appeal the decisions of code enforcers.

## Jurisdictional Issues

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different codes are enforced

Sometimes more than one state agency adopts fire safety rules for the same building, and sometimes these rules are inconsistent. Also, different jurisdictions may enforce different codes. This frequently occurs when board and care operators must meet the requirements of both state and local jurisdictions. In general, board and care providers must meet whatever are the more stringent requirements. The situation can be particularly frustrating when local jurisdictions also apply a building code. Building codes usually classify a board and care facility with six or more residents as an institutional occupancy, even when the facility serves a group of residents who are “capable of self-preservation.” As an example, some building codes require the same exits in small board and care facilities with 6 or more residents that the *Life Safety Code* does not require until the number of residents exceeds 16.

some states  
resolve differences

The issue of overly-stringent local requirements has been tackled by several states. In some states, agencies informally cooperate and mediate disputes. In other states, they use a uniform code that cannot be exceeded by local jurisdictions. Other states have simply required local jurisdictions to classify board and care homes of certain types as residential occupancies, thereby preventing local jurisdictions from enforcing unreasonable requirements.

same code, different  
interpretations

In circumstances where both state and local jurisdictions inspect the same facilities using the same code, their interpretations may differ. Conflicting interpretations may arise between state agencies (e.g., the state fire marshal and the department of health) or between a state agency and local jurisdictions. To avoid this problem, some state agencies have developed informal agreements whereby one agency inspects for both agencies. In some other states, regulations prohibit enforcement by any but one selected jurisdiction.

# Evacuation Capability

## The “Evacuation Capability” Approach

The stringency of *Life Safety Code* requirements for board and care homes depends on each home’s rating for evacuation capability. The less favorable the rating, the tougher the requirements. There are three levels of evacuation capability: prompt, slow, and impractical.

### The *Life Safety Code* definition of “evacuation capability”

“Evacuation capability is the ability of the occupants, residents, and staff **as a group** to evacuate a building or to relocate from the point of occupancy to a point of safety.” (italics added) [22/23-1.3] Note that evacuation capability is not the same as the amount of time needed to evacuate a board and home, although it is closely related. It is impossible to really know how long it would take to evacuate a board and care home during a serious fire. Instead, the evacuation capability approach allows a variety of methods that provide an approximation of how long it might take to evacuate a board and care home.



## How “evacuation capability” differs from “capable of self-preservation”

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The concept of “capable of self-preservation” has been used by regulators for decades as a means for defining which persons need to live in settings where they receive a high level of safety from fire. Persons who are “capable” are people who can generally take care of themselves during a fire. Any impairments that they have do not significantly interfere with understanding the danger of fire and taking appropriate action. Many residents of board and care homes are not capable of self-preservation. On the other hand, many residents are capable of self-preservation.

The concept of evacuation capability takes a different approach to the ability to evacuate. Instead of focusing on the individual, evacuation capability looks at the ability of the residents and staff as a group to evacuate or to relocate from the point of occupancy to a “point of safety.” (“Point of safety” is discussed beginning on page 3-3.)

willingness of staff  
to help in a fire emergency

Evacuation capability is based on the assumption that people help each other during emergencies. This tendency is even greater when people have some sort of responsibility for other people. As a generalization, staff can be depended on to help residents during a fire. In a board and care home that meets the appropriate *Life Safety Code* requirements, staff should be able to help with little added risk to themselves.

problems with  
using “capable of  
self-preservation”

The use of the “capable of self-preservation” criterion can cause difficulties for both board and care home operators and regulators. Using the evacuation capability approach avoids these problems.

- ☛ The use of “capable of self-preservation” can deny access to better residential programs by segregating clients. Regulators often categorize board and care homes according to whether they can have residents who are not capable of self-preservation. In some jurisdictions, persons categorized as “not capable” are restricted to

institutional settings and denied access to settings that provide better services and a more home-like ambience.

- ☞ Judgments of “capable of self-preservation” can have reliability and validity problems. Regulators must rely on the clinical judgment of professionals. There are no good objective measures for capable of self-preservation. Even qualified professionals can easily disagree on borderline cases. Also, many qualified professionals would rather take a “generous” view of capable of self-preservation than deny a client access to a better residential setting.
- ☞ Capable of self-preservation” does not differentiate board and care from other types of residential settings. Regulators sometimes cling to the self-preservation approach in the belief that the presence of some persons who are not capable of self-preservation differentiates board and care from other residential occupancies. However, all types of residential buildings have persons who are not capable of self-preservation. All young children, and many persons who have disabilities or who are elderly, are not capable of self-preservation. They live in private residences along side other persons who can assist them in the event of a fire. While they are at greater risk, society does not deny them the opportunity of living in normal residential settings.

## Point of Safety

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Larger buildings are often designed so that people can find temporary safety without leaving the building. Such an area of relative safety is called a “point of safety.” Residents can safely wait in these areas until they are rescued or the danger has passed.

three attributes that  
define a point of safety

The *Code*’s board and care requirements define points of safety within the building as having the following three characteristics. [22/23-1.3] (While planning to relocate to a point of safety is rarely used in board and care homes that are small or easily evacuated, the same definition applies regardless of size and evacuation capability.)

- ☞ Barriers must separate the point of safety from the areas of the building where fires are most likely to develop. There are two approaches to providing this separation. The area must be either (1) part of the exit enclosure; or (2) separated by 20-minute barriers.
- ☞ A means of egress must always lead from the point of safety so that anyone who has entered the point of safety will not need to return to other parts of the building from which it is separated. This way, if the fire cannot be quickly controlled, the fire department can evacuate people without exposing them to the fire.
- ☞ There must be some means to protect the building's structure, using either a sprinkler system or fire protective construction.

designing points of safety into a building can save money by qualifying the facility for a more favorable evacuation capability rating

A building can be designed intentionally to provide points of safety inside the building. The following are a few examples: (1) The upper floors of a building could be equipped with extra large landings on the exit stairs. (2) Sleeping room floors must be divided in some larger facilities. (See page 5-13.) If the smoke barriers meet the criteria above, they can be used to provide a point of safety. (3) Similarly, horizontal exits can be used to establish points of safety. (See page 5-4.) Regardless of the method used to establish points of safety inside the building, a board and care home has a good chance of achieving a prompt rating instead of an impractical rating when there are many residents who can not descend the stairs without help, but who could reach a point of safety without help. The savings from meeting the less stringent requirements could more than compensate for the added cost of larger stair landings or horizontal barriers.



## Issues Concerning the Validity of the Evacuation Capability Approach

### The Stability of Ratings and the Frequency of Evaluations

A common complaint about measures of evacuation capability is that evacuation capability is intrinsically unstable. Residents have good days and bad days. People may break legs or suffer temporary setbacks that would seem to invalidate the measure of evacuation capability. In some board and care homes, the capabilities of many people can steadily decline. This concern applies to any measure of evacuation capability, fire drills and Evacuation Capability Determination included. There are really two separate issues—short term instability and long term degradation.

short term instability of evacuation capability

Arguments are made that short term instability threatens the validity of evacuation ratings. At any given time, a board and care home's ability to evacuate might temporarily fall below the requirements. There are two common situations when this occurs:

- ☞ Temporary illnesses and disabilities of one or more residents mean that they require additional assistance to evacuate the board and care home.
- ☞ A new resident will temporarily require more assistance until he or she is trained in the fire emergency program.

short term instability of evacuation capability ratings is not a significant problem

Temporary disabilities that decrease evacuation capability occur in all residential occupancies, not just board and care homes. People who occupy hotels, boarding houses, houses, etc., all become temporarily disabled when they suffer illness or break a leg. People universally accept this type of short term risk. They do not move from their homes or install extra fire protection when they break a leg or suffer a temporarily disabling illness that doesn't require in-

patient care. Because the board and care *Code* requirements were designed to provide a level of safety equivalent to other residential occupancies, short term problems are no more severe than in other occupancies meeting *Life Safety Code* standards. **The fire safety requirements are conservative enough to still provide a high level of safety to persons with temporary disabilities.**

long term instability

Long term instability usually results from the gradual decline in the abilities of most or all the residents in a board and care home. This situation is most typical of board and care homes with elderly residents. The problem will become more common as programs increasingly use the aging-in-place approach.

Long term instability is a real and significant problem. A board and care home that no longer qualifies for a more favorable rating of evacuation capability will need to choose from the difficult alternatives of: (1) outplacing residents; (2) increasing nighttime staff; or (3) upgrading the fire protection features of the building. Programs that expect an overall decline among their residents should probably try to avoid such decisions by designing their buildings to comply with the requirement for the anticipated final evacuation capability rating.

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## Enforcing and Auditing Evacuation Capability Measures

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responsibility  
for record keeping

Maintaining evacuation capability ratings can be the responsibility of board and care home operators—not code enforcers. Just as operators must document that they have maintained fire alarm systems, smoke detectors, and sprinkler systems, they can also be required to keep records demonstrating that they have periodically reassessed evacuation capability. Code enforcers often rely on information provided by board and care home operators, regardless of whether they are concerned with the capabilities of humans or fire protection systems.

auditing evacuation  
capability is similar  
to auditing other  
types of records

Auditing evacuation capability is not very different from other issues of code enforcement. Enforcers don't necessarily test alarm systems, smoke detectors, and sprinkler systems. Instead, they rely on maintenance records. Regardless of whether the records are

for testing the alarm system or running fire drills, they are easily faked. In either case, a program of auditing records will greatly encourage compliance.

The *Code*-recommended approaches to finding evacuation capability levels were designed to use relatively objective evidence (specific observable behaviors) rather than conjecture. Enforcing and auditing these measures does not require a background in the social services or behavioral sciences. (Suggestions for auditing are presented in connection with the various approaches discussed in this Chapter.)

## Alternative Approaches to Establishing Evacuation Capability Ratings

the *Code* does not require  
any particular method

The *Code* leaves the choice of method for establishing evacuation capability ratings up to the authority having jurisdiction. Fortunately, the *Code* does provide some guidance by recommending a few different approaches. In practice, some other approaches have been tried. These various methods are described in the remainder of this chapter, along with the pros and cons of using each.

## Judgment of the Regulatory Authority

two judgment approaches  
used by regulatory  
authorities: case-by-case  
and uniform ratings

Because the *Code* does not require any particular method for rating evacuation capability, the regulatory authority can simply make a determination based on its judgment. Instead of using an approach that “measures” evacuation capability, the regulatory authority uses its best “hunch” to assess the evacuation capability rating. There are two different approaches: (1) regulators select an evacuation capability rating for each individual board and care home on a case-by-case basis; or, (2) regulators select the same rating for all board and care homes of a certain type.



## Judgments on a Case-by-Case Basis

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The code enforcer who uses subjective judgment to set a valid evacuation capability faces a difficult, perhaps impossible, task. The *Life Safety Code* does provide some guidance by offering the following definitions for the three levels of evacuation capability [22/23-1.3]:

### Code definition of “**Prompt**”

“Evacuation capability equivalent to the capability of the general population where applying the requirements for residential occupancies covered by Chapters... [for hotels and dormitories, apartment buildings, lodging or rooming houses, and one- and two- family dwellings].” Using this definition, a board and care home with one or more persons who need assistance to evacuate could still be a prompt facility—if sufficient staff are always available to provide the needed help.

### Code definition of “**Slow**”

“Evacuation capability of a group to move to a point of safety in a timely manner, with some of the residents requiring assistance from the staff.” Does this definition imply that prompt facilities are not allowed to have people who need assistance? The regulatory authority must decide.

### Code definition of “**Impractical**”

“A group that, even with staff assistance, cannot reliably move to a point of safety in a timely manner.” The phrase “in a timely manner” is part of, and key to, the definitions for both slow and impractical levels of evacuation capability. “In a timely manner” is slower than the time needed to evacuate other types of residential occupancies (i.e., the equivalent of prompt). But how much slower before an evacuation becomes “impractical?” Some guidance is provided by the time limit specified for fire drills in slow facilities—13 minutes. (See the section starting on page 3-10 covering fire drills.)

## One Evacuation Capability Rating for All Board and Care Homes of a Certain Type

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The approach of using a single evacuation capability rating for all board and care homes of a certain type is popular with many regulatory authorities. There are two primary reasons.

- ☞ Regulators believe that all board and care homes of a certain type are similar enough so that a single evacuation capability rating should apply.
- ☞ Many regulators distrust the evacuation capability approach. Instead of rating board and care homes individually, they simply assign the same rating to all homes of a certain type.

a uniform rating  
approach suggested in  
the Life Safety Code

The *Life Safety Code* offers an approach for setting a rating without keeping detailed records. [A-22/23-1.3] The approach is mostly applicable to large facilities with a dining room. The *Code* suggests that the regulatory authority use the requirements for an **impractical** rating of evacuation capability unless the board and care home meets the following two conditions, in which case the board and care home should receive a **slow** rating:

- ☞ “All resident [are] able to travel to centralized dining facilities without continuous staff assistance, and
- ☞ There is continuous staffing whenever there are residents in the facility.”

## Advantages and Disadvantages of Using Regulatory Judgment

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simplicity is the advantage  
of uniform ratings

There is one major advantage when regulators use a single level of evacuation capability—simplicity. Board and care homes do not need to keep records demonstrating the validity of an evacuation capability rating. Regulators do not need to review or audit those records.

some disadvantages  
of uniform ratings

Uniform ratings have some important disadvantages, as follows:

- ☞ **Lack of flexibility.** The evacuation capability approach was included in the *Life Safety Code* for board and care homes to provide added flexibility and to reduce costs. (See chapter 1 of this guide for a discussion of how and why the requirements were developed.) By using a single evacuation capability level, much of the flexibility is lost to designers and operators of board and care homes.
- ☞ **Excessive conservatism.** Where there is a broad range of evacuation capability among board and care homes, regulators have little choice but to set the single level for the worst case. If, as an example, facilities range from prompt to impractical, then prompt facilities will have to meet the same stringent and costly standards imposed on impractical facilities.
- ☞ **A missing regulatory incentive for fire safety.** Requiring board and care homes to document favorable evacuation capability ratings has an important benefit—they must establish and maintain an effective program of fire safety training for their staff and residents. With a uniform rating approach, this incentive is missing because homes will have to meet the same standards regardless of their program. Although fire drills and training are still required, there is no reward for improving and maintaining any specific level of performance.

## Fire Drills

### Time Limits

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The *Life Safety Code* suggests specific fire drill time limits for each evacuation capability level. [A-22/23-1.3]

Prompt — maximum of 3 minutes  
Slow — between 3 and 13 minutes  
Impractical — more than 13 minutes



These time limits were originally recommended by a panel of fire protection experts assembled at the National Bureau of Standards. (See the boxed text on page 1-7 of this guide.) The 13 minute time limit for the slow category may seem like too long an amount of time for an evacuation, but the fire protection requirements for slow facilities are very rigorous. The expert panel carefully reviewed a broad range of fire scenarios, and concluded that the required fire protection features would limit fire growth and spread enough to provide safety for this amount of time.

## Administrative Issues

### surprise versus announced drills

#### A Suggestion for Using Surprise Drills

To avoid their negative side effects, surprise drills can be mostly reserved for use late at night, when they provide the most conservative estimate of evacuation capability. Some residents may be unable to fall back to sleep after a fire drill. For this reason, it is often best to schedule nighttime surprise drills just an hour or two before normal waking time.

### allowing the occasional noncomplying drill time

Chapter 31 of the *Life Safety Code* requires that board and care homes conduct and record fire drills 12 times per year—4 times per year on each shift. [31-7.3] (Small board and care homes may not use shifts, as such, so the requirement is often interpreted as requiring 12 drills per year with 4 of the drills conducted at night after residents are asleep.)

The *Code* allows drills that are either a surprise or announced ahead of time. As a generalization, surprise fire drills yield a more accurate assessment of evacuation capability. However, too many surprise drills can degrade performance. When staff and residents begin to resent the intrusion of frequent surprise drills, they may only grudgingly participate in the fire safety program. Some residents may refuse to cooperate at all.

An announced drill is a less accurate assessment tool than a surprise drill. However, announced drills avoid the negative side effects of surprise drills. Moreover, announced drills can provide a better training opportunity because participants can prepare by rehearsing procedures before the drill. In some board and care homes, late night announced drills are impractical because residents stay awake in anticipation.

Earlier in this chapter (page 3-5), there is a discussion about how short term instability of evacuation capability is not necessarily a threat to the evacuation capability approach. Regulators may choose to allow an occasionally noncomplying fire drill time, provided the board and care home is demonstrating an

overall pattern of complying times, especially for fire drills conducted at night. For example, a single resident who fails to meet the time limit will cause the entire board and care home to fail—even when everyone else’s performance is very good. (The cause of the delay should always be determined and corrected.) Some regulatory jurisdictions require that board and care homes only maintain a certain ratio of complying times. For example, regulators could allow one out of every five fire drills to exceed the time limit.

#### auditing fire drills

Because late night fires are statistically more likely to result in casualties, code enforcers should try to observe a fire drill conducted at night when residents are sleeping. Night drill times are likely to be significantly slower, not only because people must wake up, but also because they reveal certain problems. For example, nighttime medications and hearing impairments can greatly reduce the likelihood that some residents will quickly respond to an alarm signal, or even awaken. (If nighttime drill times are not slower, the enforcer might consider a closer look.)

If the operator can explain a noncomplying drill time as an aberration, the enforcer may want to allow a second chance, especially when the too slow time is the result of poor performance from a single resident. As noted earlier, some jurisdictions have decided to allow an occasional failure to meet minimum drill times, provided that the overall pattern shows a high rate of success.

### Advantages and Disadvantages of Using Fire Drills

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#### advantages of using fire drills

Fire drills have the following advantages:

- ☞ They are straightforward and objective.
- ☞ They are reasonably valid if late night surprise drills are included.

#### disadvantages of fire drills

There are a few disadvantages to using fire drills to rate the evacuation capability of board and care homes.

- ☞ **Validity can be limited.** If the regulators do not require nighttime drills, but instead accept only drills conducted during the daytime, then the va-

lidity of the times will be suspect. As noted above, nighttime drills reveal special problems. However, all drills suffer from the same limitation—the smoke, stress, urgency, and confusion of a real fire emergency are mostly absent.

- ☞ **Auditing can be very inconvenient.** A fire drill used to audit an evacuation capability rating should resemble a real fire emergency when people are sleeping. Fire drills conducted late at night are inconvenient for regulators to audit. While some inspectors occasionally observe such drills, most are understandably reluctant to attend them with any regularity.

## Evacuation Capability Determination

Evacuation Capability Determination (ECD) is a paper-and-pencil scoring system for rating the evacuation capability of board and care homes. When used correctly, it is a comprehensive and conservative approach that provides detailed documentation about all the important factors that contribute to an evacuation. Because it requires so much detail, it is best suited to small or well-funded homes where the additional record keeping is not too burdensome. The following discussion summarizes the approach used by the Evacuation Capability Determination method. For complete information and samples of the worksheets, see Appendix F of the 1985 edition of the Life Safety Code or Chapter 5 of the 1988 or 1992 editions of NFPA 101M. (The ECD has not been revised since its inclusion in the 1985 edition of the *Life Safety Code*.)

### Components of the Evacuation Capability Determination

two primary parts of the  
Evacuation Capability  
Determination

Evacuation Capability Determination (ECD) rates the evacuation capability of board and care homes by examining two different factors:

- ☞ The assistance needs of the residents, and



- ☞ The availability of staff members to provide the needed assistance.

The two scores are combined to yield an “E-score” as shown here:

$$E\text{-score} = \frac{\text{total assistance needs of residents}}{\text{total availability of staff assistance}}$$

measuring the assistance  
needs of residents

Scores for assistance needs are obtained by completing one worksheet for each resident. A completed rating worksheet produces a score for the resident that indicates how much assistance he or she could need during a fire emergency. The scores for individual residents are then added to produce a total score that indicates the amount of assistance that all residents may require as a group.

Each residents is rated on seven risk factors. The score assigned to each individual resident is the highest score received on any single risk factor—the scores are not added. The ratings are based only on actual observations of behavior. The instructions provide both a clear description of each type of behavior and a short list of examples. *Whoever fills out the form must carefully read these definitions and instructions to obtain accurate and objective ratings.*

Risk Factors on the Worksheet for Rating Residents	
I. Risk of Resistance	VI. Waking Response to Alarm
II. Impaired Mobility	
III. Impaired Consciousness	VII. Response to Fire Drills
IV. Need for Extra Help	a. Initiates and Completes Evacuation Promptly
V. Response to Instructions	b. Chooses and Completes Back-up Strategy
	c. Stays at Designated Location

measuring the availability  
of staff members to  
provide assistance

A score is given to each staff member who is required to remain in the board and care home during the period of time that will yield the least favorable (highest) E-score. In almost every board and care home, this will be late at night. The accompanying table shows

### The Measurement of Residents' Assistance Needs Was Based on a Technique Used by Organizational Psychologists to Select Job Applicants

The technique used to estimate the assistance needs of residents was borrowed from a technical approach used in industrial/organizational psychology to predict job performance. The approach is called "synthetic validity." It was used to predict residents' assistance needs during a fire because the two problems are similar — how well someone will perform at a new job is similar to the problem of predicting how well a board and care resident will perform in a fire emergency. Job applicants have seldom held the precise job for which they are applying. But, they can be hired based on their past

performance on duties in previously held jobs. The trick is to only evaluate them on the duties on their prior jobs that closely resemble the duties they will be expected to perform on the new job. Performance on duties that are different between the jobs are ignored as irrelevant. When rating board and care residents, a similar approach is used — ratings of the assistance needs of residents are based only on those every day behaviors that are relevant to a fire emergency. Other types of behavior are ignored.

the various possible scores. The "promptness of response" scores for all available staff are added to obtain a total score.

Promptness of Response Scores Assigned to Individual Staff Members		
Staff Availability	Alarm Effectiveness	
	Assured	Not Assured
Standby or asleep	16	2
Immediately available	20	2
Immediately available and close by	20	10

## Administrative Issues

who should rate  
the residents?

The instructions state that the ratings of residents' needs for assistance must be based on *observed* examples of behavior. For this reason, persons (usually staff members) who are with residents on a daily basis should provide this information. However, anybody can fill out the worksheets, provided that they carefully interview staff to obtain the needed information. The ECD was specifically devised so that people providing information and completing the worksheets do not need any special background. Fire safety professionals (e.g., code enforcers) can complete the

worksheets as accurately as social workers — provided that they carefully follow the instructions to base ratings on observed behavior and to consciously avoid speculating about how a resident might perform during a fire emergency.

auditing Evacuation  
Capability Determination  
scores

Auditing administrative records supporting E-scores takes time and effort, but it is easier than it may seem. Correctly completed worksheets are based on “commonly observed examples of poor performance.” Many examples of relevant behavior can be readily observed on a daily basis (e.g., impaired mobility, response to instructions). When regulators doubt the validity of ratings, simple demonstration of performance will often suffice. In many board and care homes, a separate record of other types of behavior (e.g., risk of resistance, loss of consciousness, sleeping medications) must often be maintained for reasons unrelated to fire safety. Fire drills are an excellent opportunity to both audit ratings of individual residents as well as the overall E-score for the board and care home as a whole.

Ratings of staff availability are difficult to verify directly, because they are largely based on whether staff are asleep late at night. The presence or absence of sleeping accommodations is a clue. However, the portion concerning the loudness of alarms can be tested with a simple demonstration. When testing the loudness of alarms, doors should be opened or closed as they are normally at night. (For more information on testing the loudness of alarms, see the box on page 4-7.)

Advantages and Disadvantages of Using the  
Evacuation Capability Determination

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advantages of using  
Evacuation Capability  
Determination

There are some important advantages to using the Evacuation Capability Determination

- ☞ **The ECD is comprehensive.** The ECD reveals problems that can be missed by fire drills and other rating methods. For example, the ECD looks at “impaired consciousness,” a problem that is



unlikely to be experienced during fire drills, but that could create a serious obstacle during an evacuation if it were to occur.

- ☞ **The ECD is conservative.** Because the ECD considers so many factors, it is a very conservative approach. In a field validation study conducted by the National Bureau of Standards, there were very few instances where the ECD ratings yielded a more favorable evacuation capability rating than the fire drills times to which they were compared.
- ☞ **The ECD is a valuable tool for fire emergency planning.** One of greatest advantages of using the ECD does not directly concern *Code* requirements. Whoever completes the ratings must carefully consider the potential assistance needs of each individual resident during a fire emergency, and the availability of staff to provide for those needs. In some jurisdictions, the ECD worksheets have been used just as a fire safety planning tool, even though they were not serving any regulatory purpose.

disadvantages  
of using the ECD

There are two arguments against using the Evacuation Capability Determination method.

- ☞ **The ECD requires considerable record keeping.** Board and care home operators or regulators must maintain and periodically update ratings of each individual resident, as well as the board and care home as a whole. Persons experienced in making ECD ratings can quickly complete the forms. Small board and care homes that ordinarily keep extensive records on residents have found that the task requires little extra effort. Compared to their overall requirements for record keeping, maintaining these ratings adds little extra work. However, homes that are large or that are not used to keeping detailed records may find that the task is burdensome.
- ☞ **The ECD is easy to misuse.** Filling out the forms without carefully reading the instructions and without referring to the definitions will yield invalid ratings. If used properly, the ECD will provide reasonably objective and valid findings. But

it is tempting and easy to not bother to carefully read the instructions. To avoid this problem, it is best to train raters in the use of the ECD and to test their understanding of its basic principles.

## Combinations of Approaches

Some jurisdictions have combined different approaches. This allows them to compensate for a perceived weakness in one approach. A few examples follow.

judgment of the regulatory authority combined with either fire drills or the ECD

In this approach, the regulatory authority assigns a conservative evacuation capability rating to all board and care homes unless they can qualify for a more favorable rating. For example, the regulator might determine that “slow” is the worst rating that facilities will typically receive. Therefore, all board and care home start with being assigned the slow level of evacuation capability. However, homes can seek the more lenient requirements for a prompt evacuation capability ratings, if they can demonstrate that they qualify. Two options are commonly used to qualify a home for a more favorable rating, either (1) a program of fire drills, or (2) ratings using the Evacuation Capability Determination.

There is another situation where a regulatory authority that ordinarily relies on its judgment might want to use fire drills or the ECD. The regulatory authority might want a detailed evaluation of evacuation capability because a board and care home seems to have different evacuation problems than the homes which they normally evaluate.

the ECD combined with fire drills

A regulatory authority might prefer to use either Evacuation Capability Determination or fire drills as its primary method for rating evacuation capability. It can still use the alternative method as a means for auditing its first choice. For example, a regulatory authority might rely on the Evacuation Capability Determination as its primary approach. However, upon viewing a particular board and home, it may

have doubts about the accuracy of the ratings. The regulatory authority can then use a late night fire drill to check the accuracy of the ratings.

The reverse also applies. Regulators can use fire drills as their primary approach. However, if they feel that the fire drills are missing some important problems, they can then request that the board and care home staff complete the Evacuation Capability Determination.





# Detecting Fires and Notifying Occupants (Fire Alarms)

## Fire Alarm Systems

### Key concepts

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two necessary tasks:  
initiation and notification

Any complete approach to fire alarms must include components that accomplish two essential tasks: (1) detection or initiation; and, (2) signaling or notification. A single station smoke detector performs both tasks because it both detects the fire and sounds an alarm signal. But some types of smoke detectors are not complete systems, because they only detect the fire and must then transmit the signal to a fire alarm notification appliance (e.g. a fire alarm bell).

Section 7-6 covers  
alarm systems

The board and care chapters refer to Section 7-6 of the *Life Safety Code* which covers the requirements for a fire alarm system. This section covers such topics as the location of smoke detectors and the supervision or monitoring of installation wiring so that any break will be automatically detected. The components or parts of an acceptable fire alarm system must meet certain standards. A component that is “listed” is a component that is manufactured to meet the relevant

initiation can be  
manual or automatic

standard. The model or type of component will have been tested by an independent testing laboratory to verify that it meets the standard.

Section 7-6 specifies the requirements for two types of initiation: automatic and manual. Automatic initiation refers to the use of smoke detectors, heat detectors, or sprinklers to detect the presence of a fire. Manual initiation refers to the use of fire alarm boxes (also called “pull boxes,” “pull stations” or “fire alarm stations”) or some other means by which a person activates the fire alarm signal.

notification

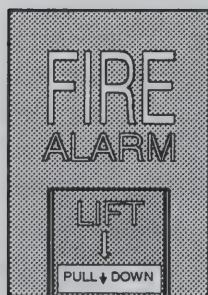
Once the alarm has been initiated, the notification appliances must alert the building’s occupants. (Notification appliances are also called “signaling devices,” and include fire alarm bells, buzzers, strobes, etc.) The *Code* generally requires that the signal be “audible,” a performance criterion that provides flexibility in meeting the requirement. In small board and care homes, operators can often meet the requirements without having to buy expensive fire alarm systems. (See page 4-7 for a discussion of the meaning of an “audible” alarm signal.)

smoke detectors

Smoke detectors are key components of fire alarm systems. However, because the requirements are so complex, smoke detectors are discussed in a separate section later in this chapter.

## Summary of Requirements for Small Facilities

fire alarm boxes  
in all small facilities



The *Code* requires a **manual** fire alarm system in compliance with Section 7-6 of the *Life Safety Code*. [22/23-2.3.4.1] Section 7-6.2.3 requires that a manual fire alarm box be placed “in the natural path of escape near each required exit.” Since “exits” are not required in small board and care homes, the provision can be interpreted as requiring a fire alarm box at each exterior door used as part of a primary or secondary means of escape. In multi-story facilities, NFPA 72 requires at least one fire alarm box on each floor, probably at the entrance to stairs used for the primary means of



### Limiting Nuisance Alarms from Fire Alarm Boxes

Nuisance alarms occur when persons maliciously activate the fire alarm. Much of the problem can be solved using one or both of the following techniques:

- ✓ **Use double-action instead of single-action fire alarm boxes.** A double action box requires the user to perform two different actions. For example, many fire alarm boxes require that a glass cover first be broken, and then a button pushed. Single action fire alarm boxes can usually be converted to double-action boxes by installing a plastic cover that must first be lifted before using the box (see below).
- ✓ **Install a commercially available plastic cover that fits over the fire alarm box.** A loud buzzer sounds when the cover is lifted to gain access to the fire alarm box. This makes it much easier to catch someone who is trying to maliciously set off the alarm, and may discourage others who are simply curious about the fire alarm box. However, when residents are trained to sound the alarm in the event of a fire, they must be alerted to the presence of the buzzer. Residents who are surprised by the buzzer may be frightened or otherwise distracted from their purpose, or believe that the buzzer is the fire alarm signal and that they have initiated the fire alarm.

escape. The fire alarm box must also be in plain sight, within easy reach (3.5 to 5 feet above the floor), and all of the same general type. [7-6.2.5; NFPA72, 3-2]

two exceptions to manual  
fire alarm systems

Commercial fire alarm systems can be difficult to afford for many smaller board and care homes, so the *Code* provides a few alternatives to reduce the expense.

- ✎ **Multiple station smoke detectors** may be used in small board and care homes instead of the more expensive fire alarm systems that require separate detectors, control/processing units, and alarm signals. (See page 4-8 of this guide for a discussion of multiple station smoke detectors.) Instead of requiring a manual fire alarm *system in addition to* multiple station smoke detectors, an exception allows fire alarm boxes to be interconnected to the multiple station smoke detectors. [22/23-2.3.4.1, exception no. 1] (For smoke detector requirements in small facilities, see page 4-10.) When someone pulls the handle of a fire alarm box, separate notification appliances (e.g., fire alarm bells) are not needed because the buzzer sounds in every smoke detector. There must be at least one fire alarm box on every floor. This approach provides

Reminder: this Guide offers interpretations of *Life Safety Code* requirements that may differ from those reasonably made by other persons.

an effective, but relatively inexpensive alternative. The exception is widely used in small board and care homes.

Manually-operated alarms allowed by exception number 1 to sections 22/23-2.3.4.1 are likely to be less reliable and effective than either listed fire alarm systems or multiple station smoke alarms. Therefore, many fire safety experts prefer that this approach be restricted to existing board and care homes, if it is used at all.

- ☞ **Manually-operated alarms that do not meet the requirements of Section 7-6.** Another exception simply allows the regulatory authority to approve some other approach to manually activating an alarm signal. This exception is intended to allow small board and care homes to avoid the expense of installing a commercial fire alarm system that uses “listed” components, provided that the regulatory authority feels that the level of protection is sufficient. For example, in a small ranch home, a few clearly marked switches wired to a notification appliance (for example, a bell originally intended for use as a burglar alarm) might work as well as a commercial system, provided that: (1) the system is frequently tested and immediately fixed if a problem is discovered; (2) everyone in the board and care home is trained to recognize the sound and respond appropriately; and, (3) the same signal is not used for two purposes (for example, the same signal could not be used for both a fire alarm and a burglar alarm). [22/23-2.3.4.1, exception no. 2]

## Summary of Requirements for Large Facilities

Requirements for large facilities that are impractical to evacuate are not covered in this guide. Use the requirements for limited care facilities in Chapters 12 (new health care occupancies) and 13 (existing health care occupancies) of the *Life Safety Code*.

A fire alarm system conforming to Section 7-6 is required in large facilities.

devices required to initiate the fire alarm system

There are four different ways to initiate the signal of a fire alarm system that might be required in any given large board and care home. [22/23-3.3.4.2]:

- ☞ **Initiation from manual fire alarm boxes.** Their placement is described in Section 7-6 which requires that a clearly marked, visible, unob-

Reminder: this Guide offers interpretations of *Life Safety Code* requirements that may differ from those reasonably made by other persons.

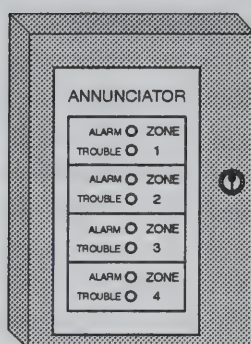
structed, and accessible fire alarm box be placed at each required exit. [7-6.2.5] In most board and care homes, this would mean that fire alarm boxes must be installed at most exterior doors and at all doors leading to exit stairs. Additional fire alarm boxes may be required in very large board and care homes, because the travel distance between boxes can not be more than 200 feet. [7-6.2.4] However, in existing homes, fire alarm boxes may not be required in certain board and care homes that have the initiation capability described below. [see 23-3.3.4.2, exception to (a) for details]

- ☞ **Initiation from a manual fire alarm box located at a convenient central control point under continuous supervision of responsible employees.** This provision is included so that the alarm can be activated from the location where residents, staff or visitors are most likely to report a fire. This location is likely to vary depending on the type of facility. In more “institutional” settings, the location would be a nursing station. In more “residential” settings, a reception desk or telephone operator’s station would be appropriate. [22/23-3.3.4.2, (b)]
- ☞ **Initiation from a sprinkler system.** If sprinklers are installed anywhere in the facility, they must be connected to the fire alarm system. [22/23-3.3.4.2 (c); 22/23-3.3.5.1] (Also see page 8-2 of this guide.) By connecting the sprinkler to the fire alarm system, greater reliability is achieved in the event that the smoke detectors are not present at the location where the sprinkler activates or that the smoke detector fails for some reason. However, if a sprinkler system is installed in an existing home, and it is not needed to meet the requirements of the *Code*, then the *Code* does not require a connection between the sprinkler system and the fire alarm system. [23-3.3.4.2, exception to (c)]
- ☞ **Initiation from any required smoke detection system, *excluding smoke detectors installed in sleeping rooms*.** Sleeping room smoke detectors are normally single station detectors, and are in-



tended to alert someone in the room that a fire has started there. By not requiring sleeping room detectors to be connected to the building fire alarm, some system false alarms may be avoided, and sleeping room detectors can be tested without initiating the system alarm signal. [22/23-3.3.4.2 (d); the exception. to (d)]

annunciator panels in  
larger new facilities



notification of  
building occupants

Annunciator panels show the zone or area where a fire or electrical fault has been detected. An annunciator panel is required in new facilities, **except** where the home has a capacity of 50 or fewer residents and the building is no more than 2 stories in height. In smaller board and care homes, it is relatively easy to locate a fire without an annunciator panel. The *Code* requires that the regulatory authority approve the location of the annunciator panel. A conveniently located annunciator helps to ensure that the location where the alarm was initiated can be immediately identified by both the home's employees and the fire department. [22-3.3.4.3]

The *Code* requires that the facility have an alarm system that is audible and that meets the requirements of Section 7-6. [22/23-3.3.4.1] The requirements are summarized as follows:

☞ **Presignal alarms are prohibited.** [22-3.3.4.4; 23-3.3.4.3] A presignal alarm delays activating the building's fire alarm evacuation signal so that employees can investigate. This type of system is unacceptable in board and care homes. Instead, the homes' management needs to vigorously attack false or nuisance alarm problems using training, proper maintenance, and, if necessary, equipment retrofits.

☞ **The alarm signal must be "audible".** To be audible, the *Code* requires that the alarm signal be clearly heard above normally loud background noise [7-6.3.6], and that it must be audible in all sleeping areas [22-3.3.4.8; 23-3.3.4.6]. (See the boxed text on page 4-7 for a related discussion of the meaning of "audible" smoke alarm signals.) This requirement can sometimes be difficult to

### What Do “Audible” and “Audible in All Sleeping Areas” Mean?

The requirements [22-23-2.3.4.2; 22-3.3.4.8; 23-3.3.4.6] that alarm signals initiated by smoke detectors outside of sleeping areas must be audible in all sleeping areas is ambiguous, but important. The dictionary meaning of “audible” is simply that the alarm can be heard.

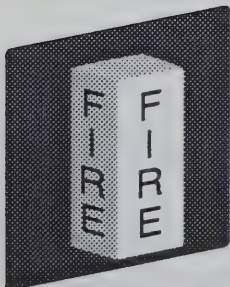
As a guideline only, the appendix of NFPA 72 [A-2-4.9] recommends that for an alarm signal to be “audible” (i.e., clearly heard), its sound level should be 15 dBA (decibels on the “A” scale) above the average level of background noise. Sound level meters can be purchased for less than \$50.00. An alarm sounding at 85 dBA outside of a closed bedroom door is likely to meet the standard. (This level of loudness is the minimum permitted for a single station smoke detector.)

Lacking a sound level meter, the alarm should probably be loud enough to immediately attract the attention of a person in a sleeping room with the door closed and with an air conditioner or TV turned on.

The requirement for an audible alarm signal does not necessarily imply that the alarm must be loud enough to wake people inside of sleeping areas. However, in the case of sleeping staff members, that goal is very desirable. In the Evacuation Capability Determination method (see page 3-15 of this guide), staff receive a great deal more credit when the alarm is loud enough to awaken them. The requirement [NFPA 101M, 5-5.3.3.1] sets a minimum of 70 dBA measured at “pillow level” where staff are allowed to sleep.

achieve. Especially in new buildings, construction can greatly reduce the loudness of an alarm signal that passes through walls and closed doors. Under these circumstances, the additional expense of providing individual alarms in sleeping rooms is preferable to extremely loud alarms in corridors. (Extremely loud alarms can permanently damage hearing.)

☞ **Distinctive, dedicated alarm signals.** The signal must be distinctive and used only for emergency purposes. [7-6.3.7; 7-6.3.9] (There have been instances where persons ignored alarms because they sounded similar to telephones.) Further, the fire alarm cannot be used to call residents to dinner or for any purpose other than to indicate an emergency such as a fire. However, an exception allows public address announcements to be made over a voice fire alarm system with approval from the regulatory authority. [7-6.3.9, exc. no. 1]



☞ **Visible alarm signals.** In addition to audible alarms, visible alarm signals are required in **new** buildings unless they are not “subject to persons who are hearing impaired.” [7-6.3.4, exc. no. 1; exc. no. 2] The wording can be interpreted as requiring most board and care homes, and certainly any with older residents, to provide visible alarm signals. Section 7-6 can be conservatively interpreted as

requiring visible alarm signals in sleeping rooms where smoke detectors are installed. However, many board and care homes qualify for exceptions to the requirement for sleeping room smoke detectors. (See page 4-10.) Even when sleeping room smoke detectors are not required, visible alarms are particularly useful in sleeping rooms where there are persons who use hearing aides, but who remove them while alone in their rooms. The requirement also includes an exception [7-6.3.4, exc no. 4] that allows other means of notification (probably staff entering sleeping rooms) that are acceptable to the regulatory authority. (Visible alarms are manufactured both in separate housings and in single housings with an audible alarm.)

new facilities in  
high rise buildings

Voice communications or public address systems are required in new facilities in high rise buildings. [22-3.3.4.5]

fire department notification

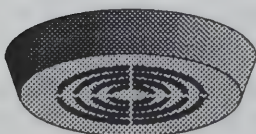
Provision must be made to immediately contact the fire department in the event of a fire. A direct connection is not required. A direct-dial telephone is sufficient, provided that the emergency plan guarantees that some employee will immediately make the call. The local fire department should be consulted about the correct number to dial (e.g., 9-1-1) and procedures. [22-3.3.4.6; 23-3.3.4.4]

## Smoke Detectors

### Key Concepts

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single station versus  
multiple station  
smoke detectors



Smoke detectors may be either single station or multiple station. (“Interconnected” is another term for “multiple station.”) Single station detectors are not connected to a fire alarm system and other detectors—each unit is self-contained. The activation of a single station detector does not affect other smoke detectors or the alarm system. This limits their effectiveness

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because a single station smoke detector is unlikely to be audible in all the sleeping rooms with the doors closed. (See boxed text on page 4-7.)

It is likely that only the smallest of small board and care homes can meet the audibility requirement without “interconnecting” the smoke detectors. This is because the smoke detector in the living room must be audible in all areas of the facility, including inside of bedrooms with the doors closed.

Multiple station or interconnected smoke detectors all sound when any one of them detects smoke. Interconnected smoke detectors are generally less expensive than a “fire alarm system” with separate detection devices, a control unit, and notification appliances. If installed to meet the recommended 30 foot spacing between smoke detectors, they may be audible in all sleeping areas. However, this is not always true, so one or more additional detectors placed just outside of bedroom doors may be needed to meet the requirement for audibility. (See the discussion of audibility in the boxed text on page 4-7.)

battery operated versus  
wired into the building’s  
electrical supply

Single station smoke detectors may be either battery-operated or “hard-wired” into a building’s electrical supply. (Multiple station smoke detectors are always hard-wired.) Batteries have the disadvantage of needing to be replaced periodically. Also, the batteries may be removed to operate another device, such as a radio. Hard-wired detectors have the disadvantage of failing if the building’s electrical supply fails. However, most experts believe hard-wired detectors are much better, because the chance of a missing or worn-out battery is far greater than the chance that the power supply will fail before the smoke detector operates. To be extra safe, you can use hard-wired detectors that have a battery backup.

early warning of smoke  
detectors compared to  
quick response and  
residential sprinklers

Quick response and residential (fast response) sprinklers activate much more quickly than standard sprinklers (see Chapter 8, Extinguishing Fires). They activate sooner than standard sprinklers, and therefore can provide some protection to people who are in the same room as the fire. In small facilities with fast-response sprinklers, the *Code* allows some, but not all, smoke detectors to be omitted, because these special

types of sprinklers react quickly enough to provide a considerable amount of early warning as well as stopping or slowing the growth of the fire. However, they are still slower than smoke detectors. This is particularly true for smoldering fires that can generate considerable smoke before flames develop and activate fast response sprinklers. There also is a remote chance that the sprinkler system will fail, and the alarm system will not be activated.

## Summary of Requirements for Small Facilities

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detectors are required in areas  
other than sleeping rooms

Smoke detectors are required on each floor of the facility, including basements, but excluding crawl-spaces and unfinished attics. Additional smoke detectors are required in living rooms, dens, day rooms, and similar spaces. The smoke detector alarms must be audible in all sleeping areas. [22/23-2.3.4.2]

exceptions for facilities with  
quick response or  
residential sprinklers

The smoke detection requirements for small board and care homes are confusing. The basic requirements are to have smoke detectors installed in both sleeping rooms and other areas outside of sleeping rooms. However, when a facility has quick response or residential sprinklers, smoke detectors may be omitted from either the sleeping rooms or the common spaces, but not from both. Most board and care homes choose to eliminate smoke detectors from sleeping rooms. [22/23-2.3.4.2, exception; 22-2.3.4.3, exception; 23-2.3.4.3, exception no. 1]

requirements when smoke  
detectors are installed  
in sleeping rooms

Single station smoke detectors are required in sleeping rooms. The detectors must be powered by the building's electrical system. [22/23-2.3.4.3]

an exception  
to sleeping room  
smoke detectors for  
**existing** facilities

Existing facilities are allowed an exception to the requirement that sleeping room smoke detectors must be powered by the building's electrical system. Battery-powered smoke detectors are allowed if (1) they were already installed when the facility was *converted* or became covered by the *Life Safety Code* standard, **and** (2) the regulatory authority believes that the board and care home has demonstrated that it will

dependably test and replace batteries. Newly installed smoke detectors must be powered by the building’s electrical system. [23-2.3.4.3, exception no. 2]

Summary of Requirements for Large Facilities

Requirements for large facilities that are impractical to evacuate are not covered in this guide. Use the requirements for limited care facilities in Chapters 12 (new health care occupancies) and 13 (existing health care occupancies) of the *Life Safety Code*.

SMOKE DETECTORS  
IN SLEEPING ROOMS

Single station smoke detectors must be installed in sleeping rooms. The detectors must be powered by the building’s electrical system. [22-3.3.4.7; 23-3.3.4.5]

two exceptions  
for existing facilities

Existing facilities are allowed two exceptions to the requirement for smoke detectors in sleeping rooms:

- ☞ Battery-powered smoke detectors are allowed if (1) they were already installed when the facility was converted or became covered by the *Life Safety Code* standard, **and** (2) the regulatory authority believes that the board and care home has demonstrated that it will test and replace batteries to ensure that the detectors will reliably receive electrical power. Newly installed smoke detectors must be powered by the building’s electrical system. [23-3.3.4.5, exc. no. 1]
- ☞ Smoke detectors inside sleeping rooms are not required in existing facilities with an existing corridor smoke detection system that will activate the building fire alarm system. [23-3.3.4.5, exc. no. 2]

DETECTORS IN AREAS  
OTHER THAN SLEEPING  
ROOMS (CORRIDORS  
AND COMMON SPACES)

Smoke detectors are required in corridors and common areas. The smoke detectors must be powered by the building electrical system and the alarm must be audible in all sleeping areas. (See the discussion of audibility in the boxed text on page 4-7.) The requirements are specified in NFPA 72E, *Standard on Automatic Fire Detectors*, which details the placement, installation, testing, and maintenance of smoke detectors. [22-3.3.4.8; 23-3.3.4.6]

Reminder: this Guide offers interpretations of *Life Safety Code* requirements that may differ from those reasonably made by other persons.



two exceptions for both new  
and existing facilities

Large facilities are allowed two exceptions to the requirement for smoke detectors in corridors and common spaces:

- ☞ Common space smoke detectors are not required in facilities protected throughout by a complying sprinkler system. (Unlike small board and care homes, quick response or residential sprinklers are not required.) [22-3.3.4.8, exc. no. 1; 23-3.3.4.6, exc. no. 1]
- ☞ Smoke detectors are not required in “motel-type” corridors, that is, where a passageway is open to the exterior of the building along at least the long dimension or “extensively open to the outside at all times.” [22-3.3.4.8, exc. no. 2; 23-3.3.4.6, exc. no. 2] Smoke detectors in such an area would be far less likely to operate since smoke can readily escape from the area. For the same reason, a passageway exposed to the outside is likely to provide a much safer means of egress than an interior corridor.

## Heat Detectors

### Key Concepts

Heat detectors  
are not substitutes for  
smoke detectors

Heat detectors are typically connected to fire alarm systems and activate at either a certain temperature or when the temperature increases at a certain “rate-of-rise.”

Some regulators may permit their use to replace smoke detectors where smoke detectors tend to produce nuisance alarms. Kitchens and furnace rooms are typical examples. Note, however, that the *Code* does not require that smoke detectors be installed in kitchens. For the most part, heat detectors are not considered to be of much value in protecting life, and should not be used as a substitute for smoke detectors in board and care homes. However, they can provide an extra measure of safety when installed in certain

locations where neither smoke detectors nor sprinklers are required. Examples include attics and crawl spaces in small board and care homes [22/23-2.3.4.2; NFPA 13D, 4-6, exception no. 3 and exception no. 4].

### Summary of Requirements

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There are no requirements for heat detectors.





# Moving People to Safer Locations

## Arrangement Of Means Of Escape and Means Of Egress

### Key Concepts

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purpose of the requirements

The safest place to be during a fire is somewhere else. The fire safety requirements for board and care homes protect people while they evacuate the building. The amount of required protection varies with the size and evacuation capability of board and care homes. Larger homes and those with residents who cannot be quickly evacuated have more stringent requirements.

two ways out

The *Code* generally requires two ways to leave each area of the building, so that, if one way is blocked by a fire, then the occupants can still use the other way. (A few exceptions are available where small facilities have a single path that is so safe that a second route is not required. [22/23-2.2.3, exc. no. 1 and exc. no. 2])

remote and independent

The *Code* sometimes specifies that the two required ways out be “independent” and/or “remote.” The reason for having remote and independent routes is to prevent fire and smoke that blocks one path from quickly blocking the other path. In general, “remote” means that the paths are located away from each other

so that an occupant can travel away from a fire that blocks one of the paths. The *Code* provides methods to determine the minimum requirements for “remote-ness” in new construction [5-5.1.4]. For existing construction, enforcers have latitude in interpreting the requirement. “Independent” means that the two paths are very unlikely to be exposed to the heat and smoke of a fire during the early stages of its growth. Thus, doors at the opposite ends of a corridor may be remote, but they are not entirely independent since smoke in the corridor can simultaneously block both routes. On the other hand, two nearby doors that lead to separate exits are independent, but they are not remote since a room fire could quickly block access to both doors.

means of escape  
versus means of egress

Both “means of egress” and “means of escape” refer to the entire paths that occupants travel from a location somewhere in the board and care home to a safe area. “Means of egress” is the term used for large facilities. “Means of escape” is the term used for small facilities. In general, the requirements for a means of escape (small facilities) are less stringent than those for a mean of egress (large facilities).

**Means of egress.** The requirements for means of egress are applied to a broad range of occupancy-types (for example, hotels and hospitals) in addition to large board and care homes. Means of egress always involve the use of exits. (See the section below on “exits.”) Unlike means of escape, the use of features like windows and balconies as part of the required egress path are prohibited. For this reason, the requirements for means of egress are more straightforward, but less flexible than the requirements for means of escape.

**Means of escape.** The concept of a “means of escape” was introduced to provide a less stringent standard for small residential occupancies, such as private homes. The more stringent requirements for means of egress are not needed in small board and care homes because the travel distances are shorter and the occupants are fewer. Moreover, it is difficult to meet means of egress requirements for small board and care homes and have

the facility still resemble a typical home, especially when board and care homes are converted from houses or other small residential structures.

#### means of escape/egress and points of safety

A means of egress or escape is an evacuation route that leads to the outside of a building—not to a “point of safety” inside the building. A point of safety inside the building can be used to qualify for a more favorable evacuation capability rating, but the entire evacuation route must be protected as required in the *Code*. (For more information about “points of safety,” see page 3-3 of this guide.)

#### exits

An “exit” is a part of a means of egress for which exacting requirements are detailed in Chapter 5 of the *Life Safety Code*. Thus, all large facilities must meet detailed requirements for exits, including signage, width requirements, and so forth. But there is more to a means of egress than the exit. A means of egress is the entire path of travel from any location in a building to a safe location outside of and away from the building. An exit is only part of that path. A means of egress is comprised of three parts, each with its own requirements:

☞ **Exit.** The “exit” is the portion of the means of egress that protects occupants while they are evacuating or preparing to evacuate the building. To protect occupants, the exit is separated from other parts of the building using fire-rated barriers, including walls and doors. *In typical structures, exits may be made up of doorways that lead outside and the interior stairs and passageways, if any, that lead to those doorways.* [3-2; 5-1.2.5]

☞ **Exit access.** The “exit access” is the portion of the means of egress that leads to the “exit.” In a typical structure, this includes rooms, corridors and common spaces. [3-2; 5-1.2.6]

☞ **Exit discharge.** The “exit discharge” is the portion of the means of egress that leads from the exit to a street or other area a safe distance from the building. [3-2; 5-1.2.7]



horizontal exits

“Horizontal exits” are a special type of exit where an area (usually a floor) of a building is divided into compartments using barriers with a 2-hour fire resistance rating. [5-2.4.3] The barriers will stop the spread of a severe fire for a considerable length of time. By crossing through a horizontal exit, occupants can reach a relatively safe area without having to use stairs. [5-1.2.8] A horizontal exit qualifies as a point of safety for the purpose of receiving a more favorable evacuation capability rating. (For more information about “point of safety,” see page 3-3 of this guide.)

primary means versus  
secondary means of escape

In small board and care homes, one of the means of escape will be a well protected path. This is the “primary” means of escape. The secondary means is an alternative that can be used when the primary means is unsafe.

means of escape from  
the facility and its floors  
versus means of escape  
from sleeping rooms

The *Code* requirements for small facilities include requirements for means of escape from every sleeping room taken individually [22/23-2.2.2; 22/23-2.2.3], from each floor [22/23-2.2.1], and from the facility as a whole [22/23-2.2.1, exc. no. 2]. Therefore, the layout of a facility may meet the requirements for two means of escape from each floor, but one or more sleeping rooms may fail to have a secondary means of escape. On the other hand, each sleeping room could have a primary and an alternative means for protecting its occupants, but the layout of the facility could still fail to satisfy the requirements for two means of escape from each floor.

In practice, most board and care homes that meet the requirement for sleeping room egress will also satisfy the requirement for egress from the floors and facility. Here is an example where this is not true. A small slow facility is sprinklered so that it qualifies for the exception to the requirement for secondary means of escape from sleeping rooms. [22/23-2.2.3, exc. no. 2] However, there is only one stairs from the second floor, so the facility fails to meet the requirement for a secondary means of escape from the second floor. [22/23-2.2.1] (Note: A complying window would qualify as the second means of escape from the second floor in a small prompt facility. [22/23-2.2.1, exc. no. 1]) Although there is an exception to the second means

	<p>of escape requirement for floors in sprinklered buildings, it cannot be used with the sprinkler exception for the second means of egress from sleeping rooms. [22/23-2.2.1, exc. no. 2] (For information about these requirements, see page 5-11.)</p>
<p>a short term refuge alternative for sleeping rooms</p>	<p>In <u>small</u> facilities, a “secondary means of alternate protection” may be used instead of a secondary means of escape from a sleeping room. The term “secondary means of alternate protection” refers to a sleeping room that is well-enough protected so that a resident can remain there for several minutes until rescued. [22/23-2.2.3(d)]</p>
<p>matching residents and sleeping room locations</p>	<p>There are no specific requirements, but it is always a good idea to consider the problems of evacuating residents when assigning them to sleeping rooms. By matching residents to sleeping rooms, evacuation capability ratings can often be improved significantly, perhaps qualifying the home for less stringent requirements. (For information about evacuation capability, see Chapter 3.)</p> <p>Here are a few examples of residents whose escape times or assistance needs can be significantly reduced: (1) a cognitively-impaired resident is moved to a room next to a “point of safety” (e.g., an exit) where he can quickly and reliably evacuate; and, (2) a person who uses a walker is reassigned to a room where there are no stairs along the means of egress, thereby no longer needing assistance to evacuate.</p>
<p>protecting the means of escape or egress</p>	<p>Barriers that prevent fire and smoke from reaching the paths leading from the building are an essential part of moving people. The <i>Code</i> includes many such requirements, as well as rules governing the use of door closers on sleeping rooms. Specific requirements for these barriers are discussed in chapter 6 of this guide, “Using Barriers to Control the Spread of Fire.”</p>
<p>interior stairs are both vertical openings and evacuation routes</p>	<p>The requirements for interior stairs are confusing and complicated, especially for small board and care homes, because the requirements are sometimes ambiguously written, and because cross references</p>

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among the sections are difficult to follow. In general, an interior stairway is always a vertical opening—so it must always meet the requirements for a “protected vertical opening” and for “enclosed interior stairs.” Fortunately, the requirements for “protected vertical opening” and for “enclosed interior stairs” have been written so that a stairway that meets the requirements for an enclosed interior stair (i.e., a primary escape route) will also meet the requirements for a vertical opening. However, in qualifying board and care homes, the requirements for an interior stairs are less stringent if it is not used as a primary means of escape. (For details, see the tables on pages 5-8 and 5-9.)

Summary of Requirements for Small Facilities

synopsis                      Simplified (incomplete) requirements for the arrangement of escape routes from small facilities are abstracted as follows:

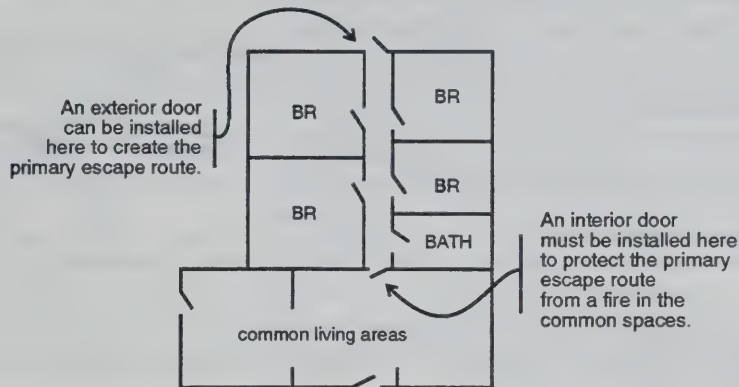
- ☞ The primary means of escape must not be exposed to “unprotected vertical openings.” [22/23-2.2.2.1]
- ☞ The primary means of escape must also be protected from common spaces in slow and impractical facilities that are unsprinklered. [22/23-2.2.2.2]
- ☞ Every floor must have a secondary means of escape. Complying windows are acceptable in prompt facilities. [22/23-2.2.1]
- ☞ Every sleeping room must use one of five alternative approaches (six for prompt facilities) for providing a secondary means of escape/protection. [22/23-2.2.3]

primary means of escape  
and common spaces                      The primary means of escape must be protected from common spaces, unless the facility has either a prompt evacuation capability rating or has quick response or residential sprinklers. [22/23-2.2.2.2, exception] In homes where the primary escape route must be protected from common spaces, the primary means of escape can not pass through areas like dining and living rooms, and kitchens. It also means that the primary

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## Primary Means of Escape in an Unsprinklered Slow or Impractical 1-story Home



means of escape must also be cut-off from these areas using barriers. (For requirements for these barriers, see page 6-8.)

requirements for interior stairs when used for the primary means of escape

When an interior stairs is used for a primary escape route, it must be cut-off at **every** floor of the building, unless the facility can qualify to use an exception. [22/23-2.2.4] (Whenever a barrier is required, it must have a 20-minute fire resistance rating—for requirements see 6-11.)

Even when a facility qualifies to use an exception to the requirement for fully enclosed stairs, the primary means of escape (including the stairs) must be protected from common spaces as discussed in the previous paragraph. In most smaller board and care homes, common spaces are found on the ground floors.

The following table on page 5-8 summarizes the exceptions that permit stairs that are open or partially enclosed to *qualify* as “enclosed interior stairs.” (The same configurations also qualify the stairs as “protected vertical openings.”)

Alternatives for Protecting **Any** Interior Stairs in Small Board and Care Homes  
(Including Stairs Used for a Primary Means of Escape)

description	qualifying types of homes			
	sprinkler requirement	evacuation capability	ok in "new" facility?	more than 3-story bldg?
Stairs are separated at every floor. [22/23-2.2.4]	none	any	yes	yes
Stairs that connect the ground floor with either the second floor or basement are separated at the ground floor and open at the other floor. [22/23-2.2.4, exc. no. 1]	none	any	yes	yes
Stairs can be open at the top floor only. [22/23-2.2.4, exc. no. 2; 22/23-2.3.1.1]	quick response or residential only	prompt and slow only	yes	no
Stairs are open at any single floor. [23-2.2.4, exc. no. 3; 23-2.3.1.1, exc. no. 2]. (In a slow facility with standard sprinklers, stairs used as a primary means of escape can <u>not</u> be exposed to common spaces. [23-2.2.2, exception])	q.r., residential, or standard ok	prompt and slow only	no	no

requirements for interior stairs when not used for the primary means of escape

Sometimes an interior stairway is not needed as a primary means of escape. The primary means of escape might be another interior stairway, an exterior stairway, a horizontal exit, or an escape route without stairs if the facility is constructed on a slope. [22/23-2.2.2.1] In existing homes, an existing fire escape can be used. [23-2.2.2.1]

The *Code* requires that the primary means of escape be protected from any vertical opening—including an interior stairway not used for primary escape. This can be accomplished by having the secondary interior stairs open to only a single floor, including the ground floor. For example, the esthetic quality of a grand staircase in a fine old home could be preserved by cutting off the stairs at the second floor and by providing another different route as the primary means of escape. [22/23-2.2.4, exc. no. 2; 22/23-2.1.1, exc. no. 1]

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Exceptions to the requirement for the protection of vertical openings were written to coordinate with the exceptions to the requirements for enclosed interior stairs, so that all the alternatives to fully enclosed stairs listed on the previous table can be used for vertical openings as well. But there are a few more approaches that can be used for an interior stairs only when it is not used as a primary means of escape. These additional alternatives are listed in the following table.

More Alternatives to Fully Enclosed Interior Stairs in Small Board and Care Homes When the Stairs are <b>NOT</b> Used for a Primary Means of Escape				
description	qualifying types of homes			
	sprinkler requirement	evacuation capability	ok in "new" facility?	more than 3-story bldg?
Stairs can be open at any single floor if there is a different primary means of escape that is separated from all lower floors. [22/23-2.2.4, exc. no. 2; 22/23-2.3.1.1, exc. no. 1]	quick response or residential only	prompt or slow only	yes	no
Stairs can be open at any single floor (max. 3) <u>and</u> exposed to common spaces if there is a different primary means of escape. [23-2.2.4, exc. no. 3; 23-2.3.1.1, exc. no. 2]	q.r., residential or standard ok	prompt or slow only	no	no

second means of escape from each story of the facility

At least two remotely located means of escape must be provided for each occupied story. [22/23-2.2.1] In "prompt" facilities, one means of escape from the floors can involve complying windows. [22/23-2.2.1, exc. no. 1] (Specifications for complying windows are provided later in this chapter.)

second means of escape from sleeping rooms

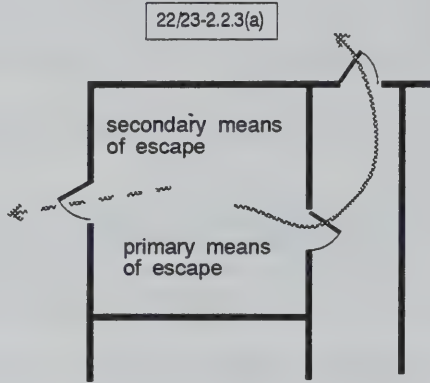
A second means of escape (or alternate protection) must be provided for each sleeping room. [22/23-2.2.3] The illustrations on page 5-10 show the types of secondary means of protection that are permitted in any small facility, regardless of the level of evacuation capability.

Reminder: this Guide offers interpretations of Life Safety Code requirements that may differ from those reasonably made by other persons.

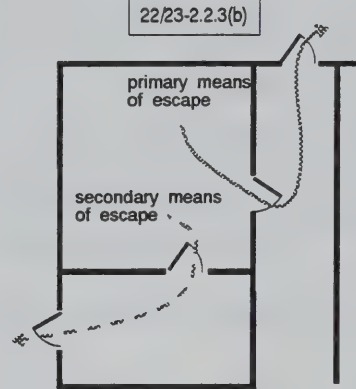


**Small Facility Approaches to Secondary Means Of Escape  
From Sleeping Rooms**  
(Each sleeping room must have one of the six alternatives below.)

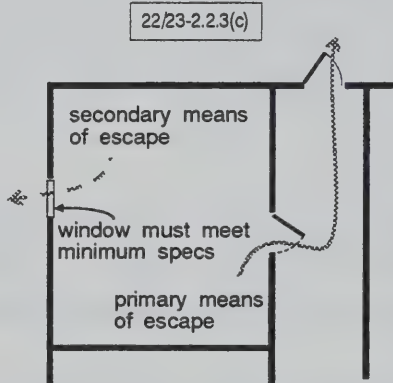
**Option a. Independent and remote route**



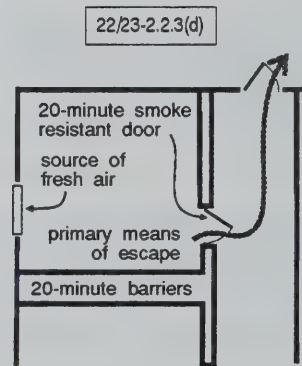
**Option b. Egress through an unlockable adjacent space**



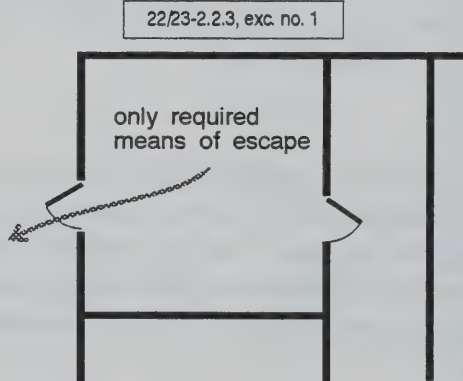
**Option c. Outside window**



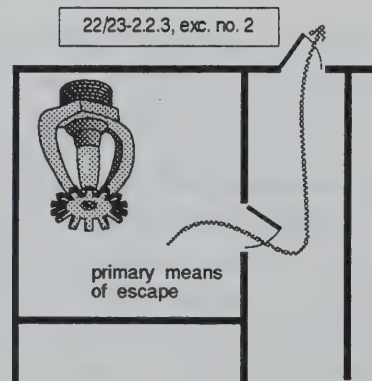
**Option d. 20-minute separations**



**Exception 1. Outside door leading to grade or stairs**



**Exception 2. If facility sprinklered, secondary means not required**




See the box and arrows on the next page for a limitation using this approach

exceptions to second means  
of escape requirements for  
small facilities with  
sprinkler systems

Exceptions to the above requirements provide a great deal of flexibility in floor plans when the facility is sprinklered. Exceptions that allow more lenient requirements for enclosing stairs were discussed earlier in this chapter. Two more exceptions provide more lenient requirements for secondary means of escape for sprinklered facilities. (See also page 5-4.)

These two exceptions  
can not be used  
together!  
[22/23-2.2.1, exc. no. 1]



☞ When the entire building is protected by a sprinkler system, a single primary means of escape from each story is acceptable, if there is still a second means from the entire facility. [22/23-2.2.1, exc. no. 2] This exception is intended to allow sprinklered split level board and care homes to avoid having to install two escape routes on each level.

☞ When the entire building is protected by a sprinkler system, a second means of escape does not need to be provided from sleeping rooms. [22/23-2.2.3, exc. no. 2] This is one of the alternative approaches shown on page 5-10.

## Summary of Requirements for Large Facilities

Requirements for large facilities that are impractical to evacuate are not covered in this guide. Use the requirements for limited care facilities in Chapters 12 (new health care occupancies) and 13 (existing health care occupancies) of the *Life Safety Code*.

### synopsis

Simplified (incomplete) requirements for the arrangement of means of egress in large facilities are abstracted as follows:

- ☞ Two remote and independent exits are required on every floor. [22/23-3.2.5]
- ☞ One egress route must be protected using either barriers or sprinklers. [22/23-3.3.6.1]
- ☞ Sleeping floors in large unsprinklered buildings must be divided into smoke compartments. [22/23-3.3.7.1]

Reminder: this Guide offers interpretations of Life Safety Code requirements that may differ from those reasonably made by other persons.

two exits from each  
floor of the facility

Separate paths leading to at least two exits must be provided from all locations in the facility. The exits must be remote and independent. (See page 5-1 for a discussion of the meaning of remote and independent.) However, a maximum “common path of travel” of 35 feet can lead from a corridor door to the point where the paths of travel to exits divide. [22/23-3.2.5] For new construction, a method is specified that quantifies “remoteness,” that is, the minimum distance allowed between exits. [5-5.1.4]

separation of sleeping  
rooms and means of  
egress from common spaces

Sleeping rooms must be separated from corridors. Both sleeping rooms and means of egress (corridors) must be separated from common spaces by barriers. [22/23-3.3.6] (For requirements for these separations, see the discussion beginning on page 6-9.)

extra protection for one  
of the means of egress

While the *Code* requires at least two exits, building occupants must first reach one of those exits. Therefore, the *Code* requires some extra protection for access leading to at least one of the exits. For any resident use area in the board and care home, there must be one primary means of egress where fire rated barriers separate it from **all** other rooms and spaces. [22/23-3.3.6.1] (For requirements for these separations, see the discussion beginning on page 6-9.) **There are three exceptions that allow the exposure of both means of egress to certain areas in qualifying board and care homes. *These areas can not be sleeping rooms.***

☞ If the other rooms and spaces are sprinklered, then the egress routes do not have to be protected from those areas. [22/23-3.3.6.1, exc. no. 1] This exception provides flexibility in laying out floor plans for common living spaces. By sprinklering areas exposed to the egress path, institutional-looking corridors can be avoided, and the facility can be designed to resemble a typical residential building. Note that new facilities covered by the 1991 edition must be sprinklered anyway. [22-3.3.5.1]

☞ If the other rooms and spaces are provided with smoke detectors that activate the facility’s general fire alarm, **and** the furnishings in the space are so



few and far apart that there is little chance for a large fire to develop, then the egress route does not have to be protected from those areas. As an example, this exception would permit a few chairs in a foyer protected by a smoke detector connected to the fire alarm. [22/23-3.3.6.1, exc. no. 2]

- ☞ If the facility has a prompt evacuation capability rating, **and** the building is no more than two stories in height, then the route can be exposed to rooms and spaces that are not common living spaces, provided that this does not expose the means of egress to any “unprotected vertical openings” (including stairs) or common living spaces. [22/23-3.3.6.1, exc. no. 3] Application of this exception is a matter of judgment for the regulatory authority, but examples of such spaces might include a staff office or an alcove containing file cabinets or book shelves.

smoke compartments  
on sleeping floors in  
nonsprinklered buildings

In nonsprinklered buildings with aggregate corridor lengths longer than 150 feet, each sleeping floor must be divided into at least two compartments of approximately equal size. The barriers dividing the compartments must resist the passage of smoke in accordance with Section 6-3 of the *Life Safety Code*, except that smoke dampers are not required. Smoke compartments are not required where each sleeping room has an exterior way of exit access. [22/23-3.3.7]

### Using Smoke Compartments as “Points of Safety”

Meeting the minimum requirements for barriers separating the compartments will not qualify the compartments as points of safety inside the building — see Chapter 3 covering Evacuation Capability for details about points of safety.

# Specifications for Means of Escape and Means Of Egress

## Summary of Requirements for Small Facilities

windows dimensions for secondary means of escape

The maximum height for windows is too great for residents to use for an unassisted escape. The requirement is more intended to ensure that fire fighters can easily rescue residents trapped in sleeping rooms.

There are relatively few specifications governing the means of escape on the assumption that the occupancy loads and travel distances are not significant factors in evacuating a small board and care home.

Windows that qualify for a secondary means of escape must meet the following criteria [22/23-2.2.3(c)]:

- ☞ maximum of 20 feet (6.1 m) from the ground, or accessible to the fire department, or opens to an exterior balcony
- ☞ operable from the inside without tools
- ☞ maximum of 44 inches (112 cm) from the bottom of the opening to the floor
- ☞ minimum opening of 20 inches (50.8 cm) wide
- ☞ minimum opening of 24 inches (61 cm) in height
- ☞ minimum opening of 5.7 square feet (.53 sq. m) in area

minimum width of doors in the means of egress

The minimum width of doors in the means of egress is 32 inches (81 cm) for new construction. However, in conversions and existing facilities, a minimum width of 28 inches (71 cm) is allowed for existing doors. A minimum width of 24 inches (61 cm) is allowed for bathroom doors. [22/23-2.2.5.1]

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## Summary of Requirements for Large Facilities

Requirements for large facilities that are impractical to evacuate are not covered in this guide. Use the requirements for limited care facilities in Chapters 12 (new health care occupancies) and 13 (existing health care occupancies) of the *Life Safety Code*.

Most of the specifications for means of egress are detailed in Chapter 5 of the *Life Safety Code*, Means of Egress. These details are too extensive to cover in this guide, and include such topics as stair dimensions, corridor widths, door hardware and widths, design of stairs and handrails, exterior stairs, horizontal exits, and so forth. Some additional requirements are also specified in the Chapters covering board and care homes (or health care occupancies for facilities with impractical evacuation capability ratings). These additional requirements are outlined as follows:

minimum corridor widths

Corridors must be at least 44 inches wide (112 m). [22/23-3.2.3.3] Thirty-six inch corridors are permitted if the means of egress serves fewer than 50 people. [22/23-3.2.3.3, exception]

maximum distance from a door to the nearest exit

The longest distance from any door to the nearest exit is 100 feet (30 m). [22/23-3.2.6.1] A maximum distance of 200 feet (60 m) is allowed if the exit access and nonseparated areas are sprinklered. The 200 foot route must also be separated from other parts of the building using fire rated barriers. In buildings up to three stories in height, 1-hour barriers are required. In buildings with more than three stories, 2-hour barriers are required. [22/23-3.2.6.1, exc. no. 2]

The methods for measuring travel distances are detailed in Section 5-6 of the *Life Safety Code*.

maximum distance for a dead-end corridor

The longest distance of one-way travel from a corridor door to two directions of travel is 35 feet (10 m). [22/23-3.2.5.2, exception]

maximum distance inside a room to exit access

The longest distance of travel within a room (or suite of rooms or living unit) is 75 feet (23 m). [22/23-3.2.6.2] In sprinklered buildings, 125 feet (48 m) is allowed. [22/23-3.2.6.2, exception]

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# Lighting and Signage

## Summary of Requirements for Small Facilities

There are no requirements for signs marking means of escape. This is because the buildings are small enough that occupants are likely to be very familiar with their configurations. (Without fire exit drills, residents are unlikely to use means of escape other than the routes they use on a routine and daily basis. See page B-2 in Appendix B of this guide.)

There are no requirements for minimum illumination and emergency lighting. This is because low occupancy loads and short travel distances make evacuations relatively straightforward, and because fires are more likely to be discovered well before they cause a power failure.

## Summary of Requirements for Large Facilities

Requirements for large facilities that are impractical to evacuate are not covered in this guide. Use the requirements for limited care facilities in Chapters 12 (new health care occupancies) and 13 (existing health care occupancies) of the *Life Safety Code*.

illumination of  
means of egress

The means of egress must have lighting supplied by the building’s electrical system. [22/23-3.2.8.1] The requirements are specified in Section 5-8 of the *Code*.

emergency lighting  
in buildings

The *Code* requires emergency lighting in facilities with more than 25 rooms, unless each sleeping room has a direct exit leading outside. [22/23-3.2.9.1] Power failures sometime occur during fire evacuations, especially in large buildings where a fire can burn unnoticed for some time. The requirements are detailed in Section 5-9 of the *Code*.

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## signage

Signs must be used to indicate the direction of travel to exits. [22/23-3.2.10.1] Signs marking the exits must comply with the requirements of Section 5-10 of the *Code* where performance requirements are specified covering illumination under both normal and emergency lighting, the size and contrast of lettering, and sign placement.





# Using Barriers to Control the Spread of Fire

## Building Construction

### Key Concepts

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purpose of the requirements

Construction requirements ensure that the building will remain standing as long as people are likely to remain inside. Therefore, more stringent requirements are imposed on board and care homes with less favorable evacuation capability ratings. (Building codes are more commonly thought of as regulating building construction requirements. For a discussion of this topic, see page 2-6.)

NFPA terminology for  
construction types

The terminology used for types of building construction is difficult to master. Construction requirements are generally specified using a shorthand notation. (For example, the *Code* permits “Type II(200)” construction in sprinkled large facilities up to 6 stories in height.) This shorthand is defined in a model standard, NFPA 220. Unfortunately, building codes use different terms, making the situation still more complicated. Tables can be used to translate the terms used by different model codes.

Construction Types	
Type I	Fire Resistive
Type II	Noncombustible
Type III	Ordinary
Type IV	Heavy Timber
Type V	Wood Frame

The types of construction are roughly ordered by the degree of protection provided, with Type I representing the highest level of protection. Most smaller board and care homes are built using either of two types of construction: Type III - ordinary construction; and Type V - wood frame. These two types of construction differ only in the materials used for the exterior walls. Ordinary construction uses masonry (brick or concrete blocks) for the outside walls, while wood frame construction uses closely spaced wood (or occasionally steel) studs for the outside walls. Both types of construction use “wood joisting,” meaning that the interior walls, floors, and roof are constructed entirely or mostly of wood. In both types of construction, hidden spaces are used for electrical wiring, plumbing, heating, and so forth. Unless these hidden spaces are protected with barriers, smoke and fire can quickly spread in these buildings.

There are three numbers associated with the construction types. These numbers refer to the minimum hourly fire resistance ratings for three basic building components: 1) exterior bearing walls; 2) structural frame/columns/girders; and 3) floor construction. As an example, Type V(111) construction is referred to as “protected wood frame,” where all internal bearing walls, floors, lofts and attics are protected with 1-hour fire resistive barriers.

The notation is just a shorthand for basic building types. The actual requirements include many details of building construction. A more detailed explanation of the terminology is beyond the scope of this guide, so the reader faced with decisions about selecting or designing suitable buildings needs to consult with a building official, architect or other competent authority.

construction and  
sprinkler systems

The *Code* makes numerous concessions for construction where sprinkler systems are installed, because a fire controlled by a sprinkler system poses little or no threat to the building’s construction. For example, the *Code* does not require any particular type of construction in small facilities where the entire building is fully protected by a sprinkler system. [22/23-2.1.3.2, exc.

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no. 3; 22/23-2.1.3.3, exception] (However, construction requirements from building codes may exceed this *Life Safety Code* requirement.) Even with a sprinkler system, certain construction requirements remain for large facilities for two reasons: (1) there is a remote chance that the sprinklers will fail to extinguish the fire while it is still small; and, (2) evacuating a slow or impractical facility can be a difficult and lengthy process.

construction and  
building size

More stringent requirements are imposed on larger facilities. Larger buildings, especially as the height increases, impose much greater stresses on the construction. The general assumption is made that occupants may need to temporarily wait for rescue in a “point of safety” within the building (See page 3-3.) Therefore, significant requirements are imposed on multistory large facilities even when the evacuation capability level is “prompt.”

Summary of Requirements for Small Facilities

sprinklered or  
impractical facilities

The *Code* has no particular construction requirements for small sprinklered facilities. [22/23-2.1.3.2, exc. no. 3; 22/23-2.1.3.3, exception] Because small impractical facilities must be sprinklered, any type of construction is allowed. [22/23-2.1.3.3, exception; 22/23-2.3.5.2]

unsprinklered  
prompt facilities

The *Code* has no particular construction requirements for small board and care homes with prompt evacuation capability ratings—there is very little chance of structural failure in a well constructed building before a prompt board and care home has been completely evacuated. [22/23-2.1.3.1]

unsprinklered  
slow facilities

As a minimum standard, the *Code* simply requires that the entire interior be sheathed with materials that provide a 15-minute fire resistant barrier. In addition, bearing construction elements like trusses, beams, etc. must be protected with 20-minute fire resistant barriers. [22/23-2.1.3.2] (More specific information about fire resistant barriers is provided is provided in the discussion starting on page 6-4.)

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## Summary of Requirements for Large Facilities

Requirements for large facilities that are impractical to evacuate are not covered in this guide. Use the requirements for limited care facilities in Chapters 12 (new health care occupancies) and 13 (existing health care occupancies) of the *Life Safety Code*.

prompt and slow facilities

Construction requirements are the same for new and existing facilities. The requirements for large facilities are complicated, with various construction types allowed depending on three considerations: (1) sprinklers; (2) sheathing; and (3) the number of stories. There is an exception for “medium” sized facilities that can be quickly evacuated — **any construction type is allowed when the facility has only one story, a prompt evacuation capability rating, and no more than 30 residents.** [22/23-3.1.3.3, exception to (a)]

## Barriers that Separate Horizontal Spaces

### Key Concepts

fire rated barriers  
are “assemblies”

#### Fire Resistance Ratings Differ from Flame Spread Ratings

Flame spread ratings are applied to interior finishes. However, both types of ratings are often applied to the same material. For example, a single layer of painted ½" gypsum board will qualify as a Class A interior finish, but will fail to qualify as a 1-hour fire rated barrier. Flame spread ratings and interior finish requirements are covered in Chapter 7, Limiting Fuel to Slow the Growth of Fire.

Barriers resist the passage of fire and smoke from one building space to another. Barriers are more than just walls, floors and ceilings. Also included are the parts used to close off openings and penetrations, including doors and door frames, interior windows, and materials used to seal penetrations for electrical and plumbing utilities. Research and fire investigations have shown that fires usually spread through these penetrations and openings long before the wall, ceiling, or floor fails.

Because a barrier is comprised of parts that must be assembled, it cannot be evaluated until after it has been installed. All the installed parts of a barrier taken together are called an “assembly.”

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Materials Commonly Used to Achieve Fire Ratings in Board and Care Facilities		
Rating of Barrier	Descriptions of Complying Materials	
	Wood Stud Walls and Partitions	Wood Joist Floors
20-minute	15-minute thermal barriers (e.g., lath-and-plaster, ½" or ¾" gypsum board) + 20-minute or "substantial" doors (e.g., 1¾" solid wood core)	not applicable
1-hour	2 layers ¾" gypsum board on both sides; OR 1 layer 5/8" type "X" gypsum board on both sides + 45 min. doors (1-hour for stairs)	5/8" type "X" gypsum board; OR 2 layers of ½" gypsum board

vigilant maintenance  
is critical to  
maintaining barriers

Because fires usually spread through penetrations, management must be vigilant whenever maintenance or installations involve fire rated barriers. It is not unusual for handymen or appliance installers to leave gaps in walls after they have finished their work, especially if they are used to working in small residential structures where there are no requirements for barriers with fire resistance ratings. Penetrations in rated assemblies must be "fire-stopped" when the work is completed.

unrated barriers that must  
resist the passage of smoke

In some instances, fire-rated barriers are not required, but the walls and doors must still "resist the passage of smoke." This allows the use of non-rated materials like hollow core doors, but there cannot be large gaps through which smoke can pass. Thus, transoms, pass-throughs, vents, etc., must be closed-off. There is no technical standard for smoke resistant walls and doors, so the regulatory authority must use its judgment.

"smoke barriers" versus  
"barriers that resist the  
passage of smoke"

Some provisions for large facilities reference the requirements for "smoke barriers" as defined in section 6-3 of the *Code*. The requirements in this section are more stringent than those for "barriers that resist the passage of smoke." For example, to qualify as a "smoke barrier," the partition must extend through

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concealed spaces, for example, the area above a suspended ceiling. This is not required for a “barrier that resists the passage of smoke.”

barriers protect sleeping residents from late night fires

The response of people to fires is greatly slowed when they are sleeping, and there are often fewer staff members on duty at night. For these simple reasons, fires late at night, when people are sleeping in their rooms, pose the greatest danger. The *Code* emphasizes protecting residents in their sleeping rooms and providing them with a safe route out of the building.

barriers protect the means of escape or egress from common space fires

Most fires in board and care facilities start in common spaces, including living rooms, recreation rooms, dining rooms, and kitchens. For this reason, the *Code* generally protects the primary means of escape or egress by separating it from such spaces.

separation of sleeping rooms and corridors

There are two reasons for requiring barriers that separate sleeping rooms from hallways and corridors.

☞ First, the corridor is protected from a fire that starts in a sleeping room. Candles and smoking materials secretly used in sleeping rooms can start fires.

☞ Second, sleeping rooms are protected from smoke and fire in the means of escape or egress. The means of escape or egress is a logical target for an emotionally unstable resident or disgruntled staff member to start an intentional fire. Also, *Code* mandated measures for keeping smoke out of the evacuation route might fail, so persons still have some safety in their sleeping rooms while waiting to be rescued.

two acceptable types of door closers

Where door closers are required, there are two acceptable types. [5-2.1.8]

☞ **Self-closing doors** are best used for doors that are normally kept closed. A spring in the hinge or a pneumatic device closes the door after every time that it is opened.



- ☞ **Automatic-closing doors** are best used for doors that are normally kept open. The door is connected to a device that holds it open and releases the door if a smoke detector is activated. The smoke detector may be part of a smoke detection system or it may be part of the door closing mechanism. Usually, an electromagnet holds the door open. When the connected smoke detector or alarm system is activated, the electrical current is cut off to the magnet, and the door closes.

#### reasons for requiring door closers

Door closers are required to ensure that the door to sleeping rooms will be shut in the event of a fire. [22/23-2.3.6.4; 22/23-3.3.6.6; 5-2.1.8] There are two important reasons for having the door closed:

- ☞ Closed doors protect residents from a fire in other areas of the building when they are asleep at night.
- ☞ When there is a fire in a sleeping room, a closed door greatly slows the rate that smoke will enter the means of escape or egress. (Of course, any occupant in the sleeping room needs to immediately escape or be rescued.)

Door closers can be a real nuisance for operators of board and care facilities. In many facilities, either the residents or the staff prefer to leave certain self-closing doors open much of the time. But blocking open a door that is part of a fire or smoke barrier is dangerous and a code violation, and therefore unacceptable. There are two legal means to handle the problem:

- ☞ **Install smoke-actuated automatic door closers.** However, these devices are expensive and rather institutional in appearance, so the better alternative is often to—

- ☞ **Install sprinklers.** Door closers are not required for sleeping room doors in sprinklered facilities. [22/23-2.3.6.4, exception; 22/23-3.3.6.6, exc. no. 2]

the relationship between  
barriers and sprinklers

The *Code* often provides more lenient requirements for fire-rated barriers when the facility is sprinklered. The reason is straightforward—walls will resist fire as long as the fire is being controlled by sprinklers, regardless of the materials used to make the walls.

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## Summary of Requirements for Small Facilities

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separation of primary means  
of escape and  
common spaces

The primary means of escape can not be exposed to common living spaces in small unsprinklered facilities with slow or impractical evacuation capability ratings. [22/23-2.2.2.2] Although the exact requirements for barriers are unspecified, this requirement can reasonably be interpreted as requiring the same 20-minute fire barriers used to protect sleeping rooms and interior stairs. (Also see page 5-6.)

separation of sleeping rooms  
in all small facilities

The Code always prohibits without exception the presence of louvers, operable transoms, transfer grills, and other air passages that might allow smoke to enter sleeping rooms. [22/23-2.3.6.2] The assemblies separating sleeping rooms from corridors must have 20-minute fire resistance ratings. [22/23-2.3.6.1] There are four exceptions to the requirement for fire resistance ratings.

- ☞ **The barriers are sprinklered on both sides.** Viewing panels can be of any size and material. Barriers that are capable of resisting the passage of smoke are still required. (For information on barriers that resist smoke, see page 6-5.) [22/23-2.3.6.1, exc. no. 2]
- ☞ **The building has a prompt evacuation capability rating.** The walls and doors must still resist the passage of smoke. [22/23-2.3.6.1, exc. no. 1]
- ☞ **The facility is existing and has an evacuation capability rating that is better than slow, but not as good as prompt.** This level of evacuation capability is defined as evacuating the building in eight minutes or less or having an E-score of three or less using the Evacuation Capability Determination method. (See Chapter 3 of this guide for

information about this method.) In these facilities, the walls and doors only need to resist the passage of smoke. [23-2.3.6.1, exc. no. 4]

- ☞ **Staff members may sleep in areas that don't meet this requirement if the alarm is loud enough to awaken them.** Residents must sleep in rooms that meet the separation requirement. The “staff members” who sleep in exposed areas cannot be residents with staff duties. [22/23-2.3.6.1, exc. no. 3]

## Summary of Requirements for Large Facilities

Requirements for large facilities that are **impractical** to evacuate are **not** covered in this guide. Use the requirements for limited care facilities in Chapters 12 (new health care occupancies) and 13 (existing health care occupancies) of the *Life Safety Code*.

existing prompt  
and slow facilities

**20-minute barriers must separate at least one of the means of egress from all other rooms and spaces.** [23-3.3.6.1] For a detailed explanation of this requirement and its exceptions, see Chapter 5 of this guide, *Moving People to Safer Locations*.

**20-minute barriers must separate sleeping rooms from all common living areas and corridors.** [23-3.3.6.2; 23-3.3.6.3] *There are two exceptions that allow barriers that do not have a fire resistance rating, but must still resist the passage of smoke.*

- ☞ The building is sprinklered. [23-3.3.6.3, exc. no. 1]

- ☞ The building has a prompt evacuation capability rating, no more than two stories, and no more than 30 residents. [23-3.3.6.3, exc. no. 2]

new prompt  
and slow facilities

**1-hour barriers must separate at least one of the means of egress from all other rooms and spaces.** [22-3.3.6] For a detailed explanation of this requirement and its exceptions, see Chapter 5 of this Guide, *Moving People to Safer Locations*.

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**1-hour barriers must separate sleeping rooms from all common living areas and corridors.** [23-3.3.6.2; 22-3.3.6.3] There are two exceptions where these barriers need only have a 30-minute rating.

☞ The building is sprinklered. [22-3.3.6.3, exc. no. 1]

☞ The building has a prompt evacuation capability rating, no more than two stories, and no more than 30 residents. [22-3.3.6.3, exc. no. 2]

converted prompt  
and slow facilities

The definition of “new” facilities usually includes board and care homes converted from other types of occupancies. (See page 9-4.) However, there are a few exceptions for conversions where less stringent requirements are allowed.

☞ In sprinklered conversions, fire-rated barriers are not required, but the separations must resist the passage of smoke. [22-3.3.6.3, exc. no. 1]

☞ In conversions that are not sprinklered, 20-minute fire-rated barriers are permitted. [22-3.3.6.3, exc. no. 3] (However, conversions are normally considered to be new facilities, and therefore must be sprinklered anyway in compliance with the 1991 edition of the *Code*. For information about the *Code*’s treatment of conversions, see page 9-4.)

## Barriers that Protect Vertical Openings and Interior Stairs

### Key Concepts


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purpose of the requirements

Vertical openings are holes in the floor/ceiling assemblies of a building. Because heat moves upwards, vertical openings between floors draw flames and smoke upwards—the same way that a chimney

	works. Protecting a vertical opening means that barriers seal off the vertical opening at the bottom or top or both.
unprotected vertical openings are major hazards	Unprotected vertical openings have been a major factor in many multi-death board and care fires. Investigations have clearly shown that unprotected vertical openings can rapidly spread fire and smoke to upper floors, quickly trapping occupants before they can escape.
interior stairs are vertical openings	The most commonly encountered vertical openings are stairs. It can be aesthetically unappealing to protect stairs, but it is often necessary from a fire protection standpoint.
sprinklers, stairs, and vertical openings	The <i>Code</i> grants some exceptions from protecting vertical openings and interior stairs when sprinklers are installed, but the exceptions are not generous. There is a high probability that sprinklers designed for use in residential occupancies will control a fire in its very early stages. However, vertical openings are so dangerous that they must often have some protection even in sprinklered facilities, because there still remains a small chance that a problem will prevent the sprinklers from operating effectively. For details about exceptions to stair and vertical opening requirements for sprinklered facilities, see Chapter 5.

## Summary of Requirements for Small Facilities

protection of vertical openings	<p>In general, the primary escape route must be protected from vertical openings. Wherever barriers are required, they must have 20-minute fire resistance ratings. [22/23-2.2.4; 22/23-2.3.1.1]</p> <p>Certain board and care homes qualify to use exceptions to avoid having to fully enclosed interior stairs and other types of vertical openings. Details about the requirements for interior stairs and vertical openings are mostly covered in Chapter 5 of this guide.</p> <p> Doors (or any other type of openings) must be self- or automatic-closing (see page 6-6).</p>
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☞ Interior stairs must be fully enclosed, unless the board and care home qualifies for an exception. [22/23-2.2.4] Other types of vertical openings can be open to one floor only, unless the board and care home qualifies for an exception. [22/23-2.3.1.1] For a discussion of when it is permitted to have interior stairs and vertical openings that are not fully enclosed, see the discussion covering the arrangement of means of escape in small facilities starting on page 5-7, and especially the tables on pages 5-8 and 5-9.

Summary of Requirements for Large Facilities

Requirements for large facilities that are impractical to evacuate are not covered in this guide. Use the requirements for limited care facilities in Chapters 12 (new health care occupancies) and 13 (existing health care occupancies) of the *Life Safety Code*.

protection of vertical openings

Vertical openings, including interior stairs, must be protected in accordance with Chapter 6 of the *Code*, Section 6.2.4, which requires separation between all floors. [22/23-3.3.1.1] The technical details of these

Barriers Enclosing Vertical Openings and Exit Enclosures in Large Facilities ("impractical" not included) [5-1.3.1; 6-2.4.4]	
description	minimum fire resistance ratings of enclosure
existing buildings: vertical openings, <u>except exit stairs</u> , connecting any number of floors [6.2.4.4(c)]	1/2 hour
existing buildings: <u>exit stairs</u> connecting less than 4 floors [5-1.3.1(a)]	1 hour
new construction: any vertical opening, including stairs, connecting less than 4 floors [5-1.3.1(a); 6.2.4.4(b)]	
new construction: any vertical opening, including stairs, connecting 4 or more stories [5-1.3.1(b); 6.2.4.4(a)]	2 hour
existing buildings: <u>exit stairs</u> connecting 4 or more floors [5-1.3.1(b)]	

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separations can be complicated, but the *Code* requirements (not including large impractical facilities) are abbreviated in the accompanying table. There are some exceptions for sprinklered facilities, but most rarely apply.

## Protection of Hazardous Areas

### Key Concepts

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definition of hazardous areas

The *Code* defines a “hazardous area” in board and care homes as “any space where there is storage or other activity having fuel conditions *exceeding* that of a one- or two-family dwelling and that possesses the potential for a fully involved fire.” (italics added) [22/23-1.3]

hazardous areas  
in small facilities

It is important to note that kitchens, furnaces, and storage areas are not defined as hazardous areas in small facilities unless the fire safety problems are greater than that found in a typical house. Keep in mind that small board and care homes may have from 4 to 16 residents. Given the definition, it seems likely that most “smaller” small board and care homes do not have hazardous areas. However, “larger” small board and care homes may store large amounts of supplies or residents’ possessions or other combustible items in a single location, or they may have service equipment that is much larger than that usually found in houses. The regulatory authority could reasonably consider such locations to be hazardous areas.

hazardous areas  
in large facilities

Large board and care homes typically store large quantities of supplies, laundry, and other combustible items, and the sizes and types of service equipment (e.g., furnaces) present a considerable threat. Unlike small board and care homes, most large board and care homes have hazardous areas. Defining a hazardous area often requires some professional judgment, but the *Code* does supply a list of examples as shown in the table to the left. [22/23-3.3.2.2]

### Examples of Hazardous Areas in Large Facilities

- ✓ Boiler and heater rooms
- ✓ Laundries
- ✓ Repair shops
- ✓ Rooms or spaces used for storage of combustible supplies and equipment deemed hazardous by the authority having jurisdiction

The *Code* also distinguishes between run-of-the-mill hazardous areas, and those that present a greater risk because they could cause an explosion. Examples of such areas are rooms with high-pressure boilers, refrigerating machinery, and transformers. [22/23-3.3.2.1]

location of hazardous areas relative to means of escape/egress and sleeping areas

The danger from a hazardous area depends on its location. When hazardous areas are just a single barrier away from sleeping rooms or a primary route out of the building, then they pose a greater threat. But a hazardous area that is remote from such areas is unlikely to immediately endanger the residents. For this reason, more stringent requirements are imposed on hazardous areas that are adjacent to means of escape/egress and sleeping areas.

### Summary of Requirements for Small Facilities

two options when a hazardous area is nearby the means of escape or sleeping rooms

When a hazardous areas is on the same floor, and it is in or abuts (that is, it is only separated by a wall) a primary means of escape or sleeping rooms, the *Code* provides two options [22/23-2.3.2(a)]:

- ☞ The hazardous area is enclosed by a barrier with 1-hour fire resistant rating and a  $\frac{3}{4}$ -hour door with either a self-closing or automatic closing device; OR
- ☞ The hazardous area is sprinklered, and it is separated from the means of escape and sleeping areas by a barrier that resists the passage of smoke. All doors must have either a self-closing or automatic closing device.

Reminder: this Guide offers interpretations of Life Safety Code requirements that may differ from those reasonably made by other persons.

two options for other  
hazardous areas

When a hazardous area fire will not immediately jeopardize the primary means of escape, the *Code* provides two options [22/23-2.3.2(b)]:

- ☞ The hazardous area is enclosed by a 20-minute fire resistant barrier, including a substantial door with a self- or automatic closing device; OR
- ☞ The hazardous area is sprinklered.

## Summary of Requirements for Large Facilities

Requirements for large facilities that are impractical to evacuate are not covered in this guide. Use the requirements for limited care facilities in Chapters 12 (new health care occupancies) and 13 (existing health care occupancies) of the *Life Safety Code*.

areas without  
explosive hazards

In general, there are two options for dealing with most hazardous areas [22/23-3.3.2.2]:

- ☞ The hazardous area is enclosed with a barrier with a 1-hour fire resistance rating and self-closing  $\frac{3}{4}$ -hour door; OR
- ☞ The hazardous area is sprinklered.

areas that contain  
explosive hazards

Hazardous areas where an explosion can occur can not be located next to or under exits. For example, an exit stairway could not pass directly above a basement room with high-pressure boiler. Further, the rooms must be protected as specified in Section 6-4 of the *Life Safety Code*. [22/23-3.3.2.1]





# Limiting Fuel to Slow the Growth of Fire

## Flammability Of Interior Wall, Ceiling, and Floor Finishes

### Key Concepts

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purpose of the requirements

#### Flashover

“Flashover” refers to the sudden ignition of combustible materials that are not in direct contact with fire. The entire room seems to burst into flames. The fire rapidly spreads beyond the room if the door has been left open.

“Interior finish” refers to the materials that line the surfaces of walls, ceilings, and floors inside the building. [6-5.1.1; 6-5.1.2] Investigations of several board and care fires have shown that combustible interior finish on walls and ceilings can greatly speed the growth and spread of fires. In a small room fire, an easily ignited interior finish can cause a fire to reach “flashover” much more quickly.

“classes” of interior finish

There are four possible categories of interior finish. [6-5.3.2] Ordered from best to worst, they are Class A, Class B, Class C, and any interior finish that fails to meet the standard for Class C. Finishes that fail to meet Class C are prohibited from any type of facility.

Materials are assigned to the different classes according to their performances on standardized tests of “flame spread.” Flame spread is a measure of how fast fire spreads across the surface of a material. In addi-

tion to flame spread, all classes of interior finish share the same limit on the amount and rate of smoke development. (“Flame spread ratings” are different from “fire resistance ratings.” For an explanation, see the boxed text on page 6-4.)

CLASS OF INTERIOR FINISH	FLAME SPREAD INDEX	EXAMPLES OF MATERIALS
Class A	0-25	gypsum wallboard, plaster, concrete
Class B	26-75	some acoustical tiles and some solid hardwood surfaces (It is rare to find materials labeled as Class B.)
Class C	76-200	some ceiling tiles and most wood paneling
Unrated	greater than 200	ceiling tiles and wood panels that don't meet the Class C standard, asphalt paper, cork, cardboard, carpeting on walls, plastic, and some wood paneling materials.

coatings and interior finish

The coating on wall materials is part of the interior finish. A few layers of normally thin wallpaper or paint should not lower interior finish ratings. However, several layers of wallpaper or a fabric covering on gypsum wallboard can ruin its Class A rating.

The rating of an interior finish can sometimes be improved to the next class by painting it with a special fire retardant coating (e.g., “intumescent” paint). For example, wood paneling and similarly combustible materials can sometimes be improved from a Class C to a Class B rating. These coatings must be applied and maintained according to their manufacturers’ specifications. (Note: using noncombustible wall tiles to improve the rating of materials over which they are applied is not generally allowed, because the heat of a fire may cause them to fall off.)

sprinklers and interior finish

The *Code* allows less favorable interior finish ratings where sprinklers are installed, because the finish on a wall will not burn as long as it remains wet.

floor coverings and interior finish

Floor coverings are considered to be less important than wall and ceiling materials because heat buildup is much slower at floor level. Therefore, floor materials are not very important during the early stages of a fire. Since April 1971, all new carpet sold in the



United States has met a Federal standard that makes it difficult to ignite and unlikely to contribute fuel until a fire is very large. (Any carpet that is older than this should probably be replaced.)

ratings for floor finish

Floor materials are rated as Class I, Class II, and not meeting the requirements for Class II.

## Summary of Requirements for Small Facilities

interior wall and ceiling  
finish in prompt facilities

Class C is permitted, along with Class A and Class B. [22/23-2.3.3, exception]

interior wall and ceiling  
finish in slow and  
impractical facilities

Only Class A and B interior finish are allowed. [22/23-2.3.3]

floor finish in  
all small facilities

There are no floor finish requirements for small facilities.

## Summary of Requirements for Large Facilities

Requirements for large facilities that are impractical to evacuate are not covered in this guide. Use the requirements for limited care facilities in Chapters 12 (new health care occupancies) and 13 (existing health care occupancies) of the *Life Safety Code*.

prompt and slow facilities

In new buildings, Class A is required within exits. In other areas, either Class A or Class B is allowed. [22-3.3.3]

In existing facilities, either Class A or Class B interior finish is required throughout the board and care home. [23-3.3.3]

In new and existing facilities, flooring in corridors and exits must have either Class I or Class II finish ratings. [22/23-3.3.3] However, the regulatory authority may not require the replacement of carpet that was previously installed in an existing facility. [22/23-3.3.3, exception]

Reminder: this Guide offers interpretations of Life Safety Code requirements that may differ from those reasonably made by other persons.

## Summary of Requirements for an Apartment Building Housing a Board and Care Facility

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interior wall and ceiling finish	<p>In new buildings, exits serving the board and care home must have Class A interior finish. [22-4.3.1; 18-3.3]</p> <p>In existing buildings, the interior finish for the exits may be either Class A or Class B. [23-4.3.1; 19-3.3]</p>
interior floor finish	<p>In new and in existing unsprinklered apartment buildings, newly installed interior floor finish in corridors and exits serving the board and care home can have either a Class I or Class II rating. In existing apartment buildings with sprinklers in the corridors, there are no requirements.[22/23-4.3.1; 18/19-3.3]</p>

## Flammability Of Furnishings

### Key Concepts

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furnishings are an important source of fuel	<p>The furniture, draperies and other furnishings in all residential buildings, board and care included, create a large amount of fuel. Research has clearly demonstrated the major role of furnishings in causing room fires to more quickly reach flashover. (For an explanation of “flashover,” see the boxed text on page 7-1.)</p>
furnishings are difficult to regulate in residential settings	<p>Prior to the 1991 edition of the <i>Code</i>, no restrictions were made on furnishings in board and care homes. However, furnishings have been regulated for some time in health care facilities. (Large impractical board and care homes must meet the health care occupancy requirements for limited care facilities.) The reluctance to regulate furnishings in board and care homes resulted from the desire to maintain a home-like feeling that is unlike the institutional atmosphere of most health care facilities. Many board and care homes allow their residents to bring their own furniture into the home to make their new surroundings more famil-</p>

Reminder: this Guide offers interpretations of Life Safety Code requirements that may differ from those reasonably made by other persons.

iar and comfortable. Some homes buy used furniture to lower their expenses.

two considerations:  
resistance to ignition  
and rate of heat release

Furnishings are important to fire prevention in two distinct ways. First, they vary in how easily they can be ignited by a cigarette or small flame. Ignition of upholstered furniture by cigarettes is a common and deadly fire scenario in residential settings. Second, after furnishings are ignited, they vary in how much heat over a period of time they contribute to the fire.

The *Code* has certain requirements covering resistance to ignition for furniture in board and care homes. However, at this time, the *Code* only includes recommendations for rate of heat release. Because there are disagreements over the appropriateness of available laboratory tests for measuring rate of heat release, the *Code* does not specify any particular standard.

curtains and draperies are  
especially dangerous

Because draperies are suspended in air, they can ignite and burn much more quickly than other types of furnishings. A waste paper fire that would otherwise burn out can rapidly engulf a room if the flames ignite a curtain.

## Summary of Requirements

Requirements for large facilities that are impractical to evacuate are not covered in this guide. Use the requirements for limited care facilities in Chapters 12 (new health care occupancies) and 13 (existing health care occupancies) of the *Life Safety Code*.

**all** board and care  
homes beginning with  
the 1991 edition

Before the 1991 edition of the *Code*, there were no requirements covering the flammability of furniture, draperies, and other furnishings. Beginning with the 1991 edition, Chapter 31 (Operating Features) imposes restrictions on new furnishings. New furnishings are defined as “unused,” so that board and care operators can allow residents to bring in their own furniture, purchase used furniture, and keep furniture already in use. The requirements apply to all board and care homes, whether new or existing, and regardless of size and evacuation capability. (The requirements for health care facilities apply to large

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impractical facilities and impose restrictions on “newly introduced” furnishings. [31-4.5.2] Thus, residents might not be allowed to bring their own furniture.)

curtains and draperies

New curtains and draperies and “other loosely hanging furnishings and decorations” must pass certain flame resistance tests specified in NFPA 701. [31-7.5.1; 31-1.4.1]

upholstered furniture

New upholstered furniture must pass a test for Class I resistance to cigarette ignitions as specified in NFPA 260. [31-7.5.2; 31-1.4.2(a)] (For large impractical facilities, a different ignition test is used – NFPA 261. [31-4.5.2; 31-1.4.2(b)]) The *Code* also recommends, but does not require, that new upholstered furniture pass a test for peak rate of heat release. [A-31-7.5.2; 31-1.4.3]

mattresses

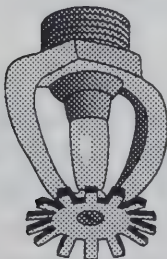
New mattresses must pass a test for resistance to cigarette ignitions as specified by a Federal standard in 16 CFR 1632. [31-7.5.3; 31-1.4.2(c)] (By Federal law, any new mattress purchased in the United States already meets this standard.) The *Code* also recommends, but does not require, that new mattresses pass a test for peak rate of heat release. [A-31-7.5.3; 31-1.4.4]

# Extinguishing Fires

## Sprinklers

The fire safety community has strongly endorsed fire sprinkler systems for all types of occupancies, board and care included. Sprinkler systems are being increasingly required for new buildings by various model codes, the *Life Safety Code* included. Fire sprinkler systems are extremely effective and, with due attention to maintenance, extremely reliable.

### Some Important Facts About Sprinklers



**Sprinklers almost never discharge accidentally and rarely leak.** It takes a severe blow to break a sprinkler head—an event that is less likely than a serious fire. Leaks in properly maintained sprinkler systems seldom occur, and usually can be fixed before any significant water damage results.

**Each sprinkler operates independently.** Each sprinkler has a “link” which will break or melt at a certain temperature. When the link breaks, water is released. The sprinkler nearest to the fire usually operates first, and only a few sprinklers are likely to operate. Therefore, water will be concentrated at the fire, and water damage will be minimized. Because the activation process is mechanical, not electrical, properly maintained sprinklers are extremely reliable. Sprinklers

rarely fail due to power outages or broken electrical connections.

**Water damage will be far less than the damage from a fire that burns out of control.** By the time a fire is large enough to activate a sprinkler head, it is large enough to do extensive damage and to immediately threaten the lives of staff and residents. In such cases, water damage is a trivial concern.

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## Key Concepts

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### components of sprinkler systems

A sprinkler “system” is made of four basic parts or components. (See page 8-4 for information about different types of sprinkler systems)

- ☞ **Sprinklers.** The most obvious parts are the individual sprinklers that distribute water over a fire. (The term “sprinklers” generally refers to the individual sprinkler “heads.”) Sprinklers must be “listed,” meaning that the design has passed special performance tests developed by either Underwriters Laboratory (UL) or the Factory Mutual Research Corporation. (See page 8-3 for information about different types of sprinklers.)
- ☞ **Piping.** All sprinkler systems use steel, copper, or plastic piping to distribute water to the sprinklers. Plastic piping must be “listed” for use in the types of sprinkler systems that are installed in board and care homes. The use of plastic pipe is not required, but can significantly reduce the costs of installation.
- ☞ **Alarms.** Sprinkler system standards require the installation of “local waterflow alarms,” meaning that a loud alarm sounds if water starts to flow through the piping. [NFPA 13, 2-9.1; NFPA 13D, 3-6; NFPA 13R, 2-4.6] *Waterflow alarms are not required in small facilities with NFPA 13D systems and smoke detectors.* [NFPA 13D, 3-6, exception]

The *Life Safety Code* also requires a connection between the waterflow alarm and the board and



care home’s fire alarm system. [22/23-2.3.5.1; 22/23-3.3.5.1] Depending on how the regulatory authority interprets the requirement, some small facilities may not be required to connect the sprinkler system to the alarm system because they qualify for an exception whereby a fire alarm “system” is not required. [23-3.3.4.1, exception; exceptions to 22/23-2.3.4.1] For example, the regulatory authority could decide that multiple station smoke detectors are not a “system,” and that a connection is not required.

- ☞ **Water supply.** Depending on the type of system and the adequacy of the public water supply, a storage tank and/or a pump may also be needed to ensure that enough water and water pressure is available to the sprinkler system.

What are “quick-response” and “residential sprinklers?”

Sprinklers are designed to release water at different temperatures (for residential settings, 135°F to 170°F) and at different sensitivities (how quickly the link will break at the rated temperature). “Fast-response sprinklers” are designed to be especially sensitive (that is, have a shorter operating time), so that the fire will be smaller when the sprinkler activates. Where people live, fast response sprinklers are effective at saving additional lives. Two types of fast-response sprinklers are used in sprinkler systems installed in board and care homes—“quick response sprinklers” and “residential sprinklers”.

**Quick response sprinklers** are essentially standard sprinklers designed to have a shorter operating time at the same temperature rating. In residential settings, a fast response is preferred, because it catches the fire earlier, giving people more time to escape. In board and care sprinkler systems that use standard sprinklers, the life saving capability of the system will be improved by substituting quick-response sprinklers. But note that quick response sprinklers are different from and cannot be interchanged with the residential sprinklers described in the next section.

**Residential sprinklers** are specifically designed to save lives in residential settings. Like quick-response

sprinklers, they are fast-response sprinklers designed to operate quickly. But residential sprinklers also distribute water in a specific pattern designed to better prevent the growth of the types of fires expected in residential settings. This improves their capability of protecting persons who are in the room where a fire starts. Therefore, many fire safety experts prefer residential sprinklers over standard and quick response sprinklers in small board and care homes.

Note that the locations and numbers of required sprinklers differ depending on whether residential or standard/quick response sprinklers are being used. For this reason, residential sprinklers can not be used where the piping has been laid out for standard or quick response sprinklers. The system must be specifically designed for residential sprinklers.

#### Three types of sprinkler systems

There are three different types of sprinkler systems allowed in the *Code*, depending on the type of facility. It is important to understand the differences.

#### NFPA 13

Described in the basic sprinkler standard, “NFPA 13” systems are used in most types of occupancies. These systems are conservatively designed. A large water supply and sprinklering of all spaces is required, making these systems more expensive than the “NFPA 13D” and “NFPA 13R” alternatives. *In board and care facilities, NFPA 13 systems can be designed to use listed residential sprinklers, which significantly improves their life safety capabilities.*

#### NFPA 13D

The “D” stands for “dwelling.” The design is much less conservative than that used for NFPA 13 systems. These systems were developed in the late 1970’s as a low cost alternative suitable for houses, duplexes, and mobile homes (where the amount of combustible materials tends to be less than found in other types of occupancies). *Only residential sprinklers can be installed in NFPA 13D systems.* The costs of installing this standard are significantly lower than other systems for the following reasons:

- ☞ The water supply duration needs to last only 10 minutes. (The *Code* requires a 30-minute supply for small impractical board and care homes.) Depending on the water pressure of the public water

system, a hookup without additional storage facilities may be allowed. But even where additional storage is needed, the costs are significantly lower.

- ☞ Coverage is not required for some spaces (unoccupied attics and basements, small bathrooms, and small closets), so fewer sprinklers and less plumbing is required, thus reducing the costs of labor and material.

### NFPA 13R

The “R” stands for “residential.” The conservatism of the designs used for NFPA 13R systems falls in between that used for NFPA 13 and NFPA 13D systems. Referenced for the first time in the 1991 edition of the *Life Safety Code*, these systems fall between the NFPA 13 and NFPA 13D systems and are designed for somewhat larger residential settings like hotels and apartment buildings that are no more than four stories high. *With rarely used exceptions, residential sprinklers are required in NFPA 13R systems.* The requirements for water supplies are the same as NFPA 13 light hazard systems, but like NFPA 13D systems, sprinklers can be omitted from certain locations.

Even where optional, there are numerous incentives to install sprinklers.

Existing facilities that install sprinkler systems qualify for several exceptions to certain *Life Safety Code* requirements. These exceptions provide an incentive to operators to install sprinkler systems—in some instances, the installation of a sprinkler system is no more expensive than a combination of all the other upgrades that can be avoided. The tradeoffs for sprinklers are technically justified as well. ***But it is critical for board and care operators to ensure that the sprinkler system will work in the event of a fire.*** They must be certain that they continue to meet the requirements of the *Life Safety Code* and the NFPA sprinkler standards that will ensure that the water supply is always maintained and that the sprinklers are never obstructed. Tables that list examples of exceptions permitted for installing sprinklers can be found on pages 8-6 and 8-8.



Summary Of Requirements in Small Facilities

the 1991 edition of the *Code* requires sprinklers in all *new* facilities

New facilities include not only new construction, but also changes in occupancy. (See page 9-4.) Thus, when a facility is converted from a single family house or a lodging house, the 1991 edition requires the operator to install a sprinkler system that complies with this *Code* requirement. While the earlier editions of the *Code* do not require sprinkler systems in many types of new board and care facilities, there are enough incentives offered that it can be more cost-effective to install a sprinkler system anyway.

even sprinkler systems that are not required must meet requirements

Sprinkler systems are not required in existing prompt and slow facilities. A sprinkler system that is installed, but is not needed to satisfy *Code* requirements, must still meet the same requirements. [22/23-2.3.5.1]

prompt and slow small facilities

NFPA 13, NFPA 13R, and 13D systems are permitted. Sprinklers are not required in very small closets and bathrooms (although fire barriers must be added in *new* facilities) and the system must activate the fire

Examples of Exceptions for Installing Sprinklers in Small Facilities

- ✓ In sprinklered areas, bearing walls and partitions, columns, beams, girders and trusses do not need to be protected using fire resistant barriers. [22/23-2.1.3.2, exc. no. 3; exception to 22/23-2.1.3.3] (See page 6-3.)
- ✓ Closers can be omitted from sleeping room doors. [22/23-2.3.6.4, exception; 22/23-3.3.6.6, exc. no. 2] (See page 6-7.)
- ✓ A second means of escape can be omitted from sleeping rooms. [22/23-2.2.3, exc. no. 2] (See page 5-11.)
- ✓ A second means of escape from each floor can be omitted, provided that the “facility” has a second means of escape, and that each sleeping room has a second means of escape (that is, this exception cannot be used if the previous exception is also used). [22/23-2.2.1, exc. no. 2] (See page 5-11.)

MORE EXCEPTIONS IF QUICK RESPONSE OR RESIDENTIAL SPRINKLERS HAVE BEEN INSTALLED

- ✓ Smoke detectors can be omitted from either sleeping rooms, or common spaces, but not both. [22/23-2.3.4.2, exception; 22/23-2.3.4.3, exception no. 1] (See page 4-10.)
- ✓ The primary means of escape can be exposed to common living areas. For example, the primary means of escape can pass through or by the living room, kitchen, etc. [22/23-2.2.2] (See page 5-6.)
- ✓ For prompt and slow facilities, stairs do not have to be fully enclosed, if the building is less than four stories and the stairs either do not pass through a lower floor or are protected from lower floors by barriers with 20-minute fire resistance ratings. [22/23-2.2.4, exc. no. 2; 22/23-2.3.1.1] (See page 5-8.)

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alarm system. [22/23-2.3.5.1, exc. no. 1] Quick response or residential sprinklers must be used in new facilities. [22-2.3.5.2]

impractical small facilities

NFPA 13, NFPA 13R, or 13D sprinkler systems are required in existing as well as new impractical small facilities. [22/23-2.3.5.2] The system must be supervised in new facilities. [22-2.3.5.3; 7-7.2] Where a 13D system is installed, a 30 minute water supply must be provided [22/23-2.3.5.1, exc. no. 2]

## Summary of Requirements for Large Facilities

Requirements for large facilities that are impractical to evacuate are not covered in this guide. Use the requirements for limited care facilities in Chapters 12 (new health care occupancies) and 13 (existing health care occupancies) of the *Life Safety Code*.

the 1991 edition of the *Code* requires sprinklers in all new facilities

New facilities include not only new construction, but also changes in occupancy. (See page 9-4.) Thus, when a facility is converted from a hotel or nursing home, the 1991 edition requires the operator to install a sprinkler system that complies with this *Code* requirement. While the earlier editions of the *Code* do not require sprinkler systems in many types of new board and care facilities, there are enough incentives offered that it can be more cost-effective to install a sprinkler system anyway.

prompt and slow facilities

The *Code* permits either NFPA 13 or NFPA 13R systems in buildings less than five stories. [22/23-3.3.5.1, exc. no. 1]. NFPA 13 systems must be used in buildings with five or more stories. [22/23-3.3.5.1] In a departure from the requirements in NFPA 13, the *Code*'s board and care chapters do not require sprinklers in very small closets and bathrooms, although these spaces must be separated by fire barriers in new facilities. [22/23-3.3.5.1, exc. no. 2]

Quick response or residential sprinklers are required in new facilities. (A few exceptions allow standard sprinkler heads in certain building areas.) [22-3.3.5.1] Note that quick response and residential sprinklers are permitted in existing facilities where their superior

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life saving capability makes them preferable to standard sprinklers. A list of examples of exceptions permitted in existing prompt and slow board and care homes that have sprinkler systems is provided in the table on page 8-8.

#### Examples of Exceptions for Installing Sprinklers in Prompt and Slow Large Facilities

- ✓ Longer travel distances are allowed within rooms (125 feet instead of 75). [22/23-3.2.6.2, exception] (See page 5-15.)
- ✓ Smoke detectors can be omitted in common spaces. [22-3.3.4.8, exc. no. 1; 23-3.3.4.6, exc. no. 1] (See page 4-12.)
- ✓ Sleeping room doors do not have to have closers. [22/23-3.3.6.6, exc. no. 2] (See page 6-7.)
- ✓ Floors with sleeping room do not have to be divided into smoke compartments. [22/23-3.3.7, exception] (See page 5-13.)
- ✓ In existing facilities, barriers separating the means of egress need only resist the passage of smoke—no fire rating is required. [23-3.3.6.3, exc. no. 1] (See page 6-9.)

## Fire Extinguishers

### Key Concepts



For the most part, the *Code* does not address fire extinguishers. However, other fire codes enforced by state and local jurisdiction often do make the requirement. The issue is controversial. On the pro-extinguisher side, arguments are made that a great many small fires are successfully extinguished. Thus, extinguishers have been used to avert some tragic fires. On the anti-extinguisher side, arguments are made that evacuations and fire department notifications have been delayed when people untrained about how and when to use fire extinguishers fail to successfully control fires. Two problems occur—either the fire was too large to be extinguished with the available extin-

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guishers, or the person improperly operated the extinguisher.

Some persons don't want extinguishers available to residents for fear that they may use poor judgment in their use. But if extinguishers are hidden away only for staff use, there is a greater chance that staff will forget about their availability.

If extinguishers are installed, it is important that all persons authorized to use extinguishers learn how they are operated, and for what types of fire they are effective. Local fire departments can often provide hands-on training, and there are good training videos that should be useful.

## Summary Of Requirements

Requirements for large facilities that are impractical to evacuate are not covered in this guide. Use the requirements for limited care facilities in Chapters 12 (new health care occupancies) and 13 (existing health care occupancies) of the *Life Safety Code*.

small facilities

The Code does not require fire extinguishers in small facilities.

prompt and slow  
large facilities

Portable fire extinguishers are required near hazardous areas. [22/23-3.3.5.3]



# The Fire Safety Evaluation System (FSES)

## What is an FSES?

an FSES determines  
equivalency to *Code*  
requirements

The *Life Safety Code* specifically allows the use of methods that provide an equivalent level of safety to that prescribed by the *Code* [1-6.1]. A Fire Safety Evaluation System (FSES) is a procedure for making determinations of equivalency. It uses a numerical scoring system that determines if a combination of fire safety features provides a level of safety that is equivalent to the level of safety provided by meeting the specific requirements of the *Code*. An FSES allows certain tradeoffs of fire safety features—a fire safety feature that fails to meet the requirements of the *Code* may be allowed if another fire safety feature exceeds the requirements of the *Code*.

One Fire Safety Evaluation System is available specifically for evaluating designs of board and care homes. The FSES for board and care homes is published as appendix F in the 1985 edition of NFPA 101 (the *Life Safety Code*) and as Chapter 6 in the 1988 and 1992 editions of NFPA 101M (*Alternative Approaches to Life Safety*). (Another FSES is available for health care facilities, which can be used to evaluate large board and care homes with an impractical evacuation capability rating.)



extra credit  
compensates  
for deficiencies

The FSES gives “extra credit” for board and care homes that have features that exceed *Code* requirements. For example, the *Code* allows an existing small sprinklered facility to operate with a limited number of smoke detectors located only in common spaces on every level. [22/23-2.3.4.2; 22/23-2.3.4.3, exc. no. 1] However, the FSES gives a higher score when the facility also has smoke detectors installed in the sleeping rooms. This higher score can be used to offset a deficiency in another area, for example, the absence of any manual pull stations.

the FSES changes  
as the *Code* changes

Because the board and care chapters change with *Code* revisions, the Fire Safety Evaluation System must be reviewed and updated to ensure that its scoring system still provides an equivalent level of fire safety to the latest edition of the *Code*. The FSES in the 1992 edition of NFPA 101M should be used to establish equivalencies with requirements in the 1991 edition of the *Life Safety Code*. (See page 9-5 for a discussion of how changes to the 1992 edition of the FSES have affected the evaluation of new facilities.)

## An Overview of Safety Parameters and Redundant Safety Subsystems

There are two fundamental concepts underlying the FSES—safety parameters and redundant safety subsystems.

safety parameters

Safety parameters are categories of fire protection features. The FSES for board and care homes rates the facility on each of the safety parameters. Each safety parameter is divided into levels of fire protection, and each level is assigned a numerical score. On the next page is an example from the worksheet for small facilities from the 1992 edition of NFPA 101M. (The numbers in parentheses and the superscript letters refer to notes that specify interactions between parameters. See the FSES for details.)

## Safety Parameters Used in the FSES for Board and Care Homes

BOTH LARGE AND SMALL FACILITIES	SMALL FACILITIES ONLY
<ul style="list-style-type: none"> <li>✓ Construction</li> <li>✓ Hazardous Areas</li> <li>✓ Manual Fire Alarm</li> <li>✓ Smoke Detection and Alarm</li> <li>✓ Automatic Sprinklers</li> <li>✓ Interior Finish</li> <li>✓ Separation of Sleeping Rooms (includes vertical openings in small facilities)</li> </ul>	<ul style="list-style-type: none"> <li>✓ Egress</li> </ul>
	<b>LARGE FACILITIES ONLY</b> <ul style="list-style-type: none"> <li>✓ Exit System</li> <li>✓ Exit Access</li> <li>✓ Smoke Control</li> <li>✓ Vertical Openings</li> </ul>

## Example of a Safety Parameter

4. SMOKE DETECTION & ALARM	None	Limited Warning/ Single Lev. Det.	Warning to All Bedrooms		Total Coverage System
			Every Lev. Det. <sup>E</sup>	Plus Det. in Each Bdrm <sup>F</sup>	
	-4	0	2	3(4) <sup>G</sup>	4

## redundant safety subsystems

## Safety Subsystems

1. fire control
2. egress
3. refuge
4. general fire safety

Code requirements for board and care homes reflect a fundamental principle of good fire protection engineering—there must be redundancy so that the failure of any one device or approach will not result in death or injuries to residents. The engineers who developed the FSES determined that board and care homes need three basic subsystems to reliably protect residents from fires: fire control, egress, and refuge. A fourth overall category was added—general fire safety.

## Uses for the FSES

The FSES can be very useful when existing buildings must be upgraded to meet *Code* requirements. This occurs with either of two events:

- ☞ An existing building is converted to a board and care home, and must then meet the requirements for a new facility, or
- ☞ An established board and care home must be upgraded to meet newly imposed *Code* requirements for an existing facility.

There are two primary reasons for using the FSES to upgrade existing buildings:

- ☞ To find a less costly way to upgrade an existing building.
- ☞ To preserve an aesthetically valuable architectural feature (for example, an unenclosed interior staircase).

conversions are new facilities

Conversions usually involve a change of occupancy, and the *Code* treats changes of occupancy as new facilities. [1-7.4] More than any other occupancy, board and care homes are conversions from other types of occupancies. A wide range of building types are converted to board and care homes. Houses are converted to small board and care homes. Lodging houses, motels, mansions, and small hotels are converted to medium-sized board and care homes. Nursing homes are converted to large board and care homes. The economic problems of bringing buildings up to code are important to operator profitability and to programmatic flexibility. The flexibility allowed by the FSES can be of great value when dealing with conversions, at least when *Code* editions prior to the 1991 edition are being used.



beginning with the 1992 edition, the FSES is less helpful for conversions

As noted in Chapter 8 of this guide, all new facilities must be sprinklered beginning with the 1991 edition of the *Code*. This new requirement has resulted in major changes in the 1992 edition of the FSES. In earlier editions of the FSES, the numerical scores needed to establish equivalency were the same for both new and existing facilities. However, in the 1992 edition of the FSES, the requirements for new facilities became far more stringent than for existing facilities. The requirements are now so stringent that a new small facility without sprinklers will fail the FSES, even if it receives the highest possible scores for all other fire safety features. Another consequence is that there are far fewer combinations of fire safety features that will pass the FSES. For these reasons, the FSES is now much less useful for evaluating any board and care home classified as “new”—including conversions.

upgrading to meet  
*Code* requirements for  
existing homes

When jurisdictions first adopt the *Code*, they often allow operating board and care homes to meet the requirements for existing facilities. Many of these homes will find it very worthwhile to install residential or quick response sprinklers in their facilities. This will allow them considerable flexibility when the FSES is applied. (Even without the FSES, they will be able to take advantage of the many exceptions that are permitted in existing facilities when they are sprinklered—see the tables on pages 8-6 and 8-8.)



# Using the *Life Safety Code* to Regulate Adult Foster Care

## Policy Issues

### Fire Safety in Adult Foster Care Homes

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many homes providing foster care fall outside the scope of board and care

Some foster care programs support homes with four or more residents. Despite the use of the foster care label, the *Life Safety Code* clearly defines these homes as board and care homes.

The *Code* defines a board and care home as providing personal care to four or more residents unrelated to the owners or operators. Therefore, a very small personal care home with only three residents falls outside the definition of a board and care home. Such small homes are most typically called “adult foster care.” For this reason, the label “foster care” is used in this appendix to refer to all such very small homes.

cost advantages of foster care

Foster care programs are becoming increasingly common as an alternative to “board and care.” One result is that operators escape the higher costs of meeting fire safety standards when setting up a board and care home.

high casualty rates in private residences

Most fire casualties occur in people’s own homes. Persons who are less capable of protecting themselves (the very old and very young) die at a much higher



rate than other persons. On the average, private homes are not very fire safe. Building codes have become more strict in recent years, but they apply only to new construction. Fire codes are not generally applied, because the policies of local governments reflect their constituents' beliefs that government should not interfere with private homes once they are occupied.

unregulated foster  
care is too risky

Some foster care programs scarcely regulate the fire safety in homes. They might require a smoke detector and a fire extinguisher and nothing else. The reason is that foster care is provided in a home, and private homes are traditionally not regulated for fire safety. Given the prevalence of disabilities among their residents, foster care homes that are not regulated for fire safety can be excessively dangerous places.

## Life Safety Code Requirements Applicable to Homes Providing Foster Care

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two alternative  
sets of requirements

This section examines the application of two alternatives sets of *Code* requirements that can be applied to adult foster care homes: (1) the requirements for small board and care homes; and, (2) the requirements for one- and two-family dwellings. Adult foster care is not a term used in the *Life Safety Code*, and the *Code* does not directly address settings that provide personal care to fewer than four residents. (The *Life Safety Code*'s breakpoint of four residents can and often does differ from the maximum number of residents that many regulators allow in a single adult foster care setting.) The *Code* defines a setting that provides personal care to four or more residents as a board and care home, but regulators can still decide to use board and care requirements for these smaller homes. Alternatively, regulators can use the *Code*'s requirements for one- and two-family dwellings, which provide significantly more safety than is typically found in older single family houses and duplexes.

### The Lodging or Rooming House Alternative

The *Code* also has a chapter devoted to "lodging or rooming houses," defined as an occupancy that provides sleeping accommodations for 16 or fewer persons. [20-1.1.1] The fire safety requirements generally fall between those for one- and two-family dwellings and for a small prompt board and care home. Thus, the *Code* requirements for lodging and rooming houses should be considered as well, especially where foster care is provided in a multistory building.

board and care *Code*  
requirements applied to  
foster care homes

The *Life Safety Code* board and care requirements are very stringent when applied to foster care settings with one to three clients. Some states do enforce *Code* requirements for board and care to assure a high level of safety in foster care homes. This approach may not seem excessive in states that enforce health care re-

quirements in all board and care homes larger than foster care settings. However, the expense of operating personal care facilities where such stringent codes are enforced may inhibit the availability of such care.

one- and two-family dwelling *Code* requirements applied to foster care homes

Many states prefer to enforce requirements for foster care homes that are less stringent than the board and care provisions, but these regulators still need to provide a level of safety that is improved over most unregulated private homes. The *Life Safety Code* has a chapter covering one- and two-family dwellings that can be used for this purpose. (Of course, agencies that use these requirements may add additional requirements.) The remainder of this appendix summarizes the *Code* requirements for one- and two-family dwellings.

## Code Requirements for One- and Two-Family Dwellings

### Overview

Where the *Code* requirements for one- and two-family dwellings cover the same topics as the requirements for small board and care homes, the two sets of requirements are similar. Like small board and care requirements, the requirements for one- and two-family dwellings require two ways out from any occupied part of the building. However, the requirements for small board and care homes are purposely more stringent than for dwellings, and include many additional requirements. *Most notably, there are far more requirements intended to limit the growth and spread of fire in small board and care homes.* As an example, the provisions for one- and two-family dwellings do not require the protection of vertical openings and interior stairs.

Reminder: this Guide offers interpretations of Life Safety Code requirements that may differ from those reasonably made by other persons.

## Means of Escape

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primary and secondary  
means of escape required

The *Code* requires two ways to escape from every living and sleeping area in dwellings [21-2.2.1]—just as it does for board and care homes.

primary means of escape  
does not have to be protected

Unlike board and care homes, the primary means of escape does not have to be separated from other living areas and from stairways and vertical openings.

alternatives for  
secondary means of escape

There are five alternatives (including options and exceptions) that can be used to meet the requirements for a secondary means of escape in one- and two-family dwellings [21-2.2.3]. The alternatives are the same as those allowed in a small prompt board and care homes—with one important difference. One option available to small board and care homes is not available to dwellings—the use of twenty-minute fire resistant barriers to separate sleeping rooms does not qualify as an alternative means for protecting residents in one- and two-family dwelling. (This approach is not advisable in one- and two-family dwellings, because, unlike board and care homes, there are no additional requirements that would limit the growth and spread of fire.) A comparison of the alternatives for dwellings and board and care facilities is summarized on the next page.

two primary routes in  
very large dwellings

Every story of a dwelling that is either larger than 2,000 square feet or that has a primary means of escape that is longer than 75 feet must have a second primary means of escape that is remotely located from the first primary route. [21-2.2.4] There are exceptions for sprinklered and existing buildings. [exceptions to 21-2.2.4]

minimum dimensions

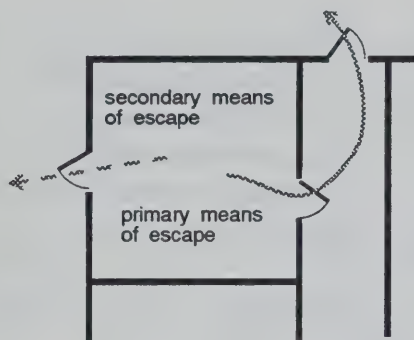
The requirements for dwellings include minimum dimensions for new hallways, stairs, and doors. [21-2.4; 21-2.5; 21-2.6]

Reminder: this Guide offers interpretations of Life Safety Code requirements that may differ from those reasonably made by other persons.

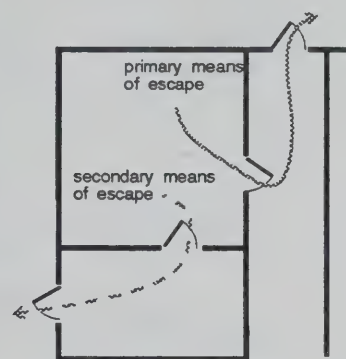


Comparison Between Alternatives for Secondary Means of Escape Requirements  
for One- and Two-Family Dwellings and Small Board and Care Homes  
(Each sleeping room must have one of the alternatives below.)

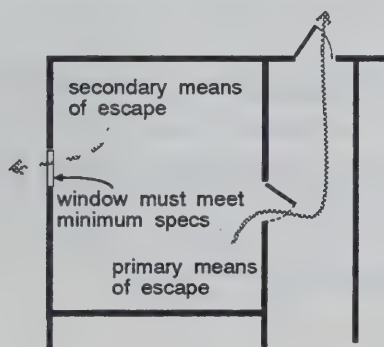
Option a. Independent and remote route



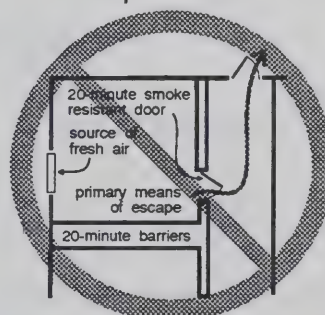
Option b. Egress through an unlockable adjacent space



Option c. outside window

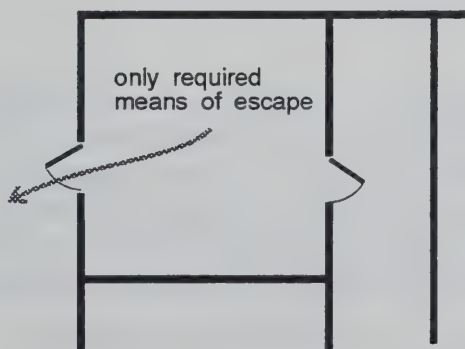


Option d. 20-minute separations

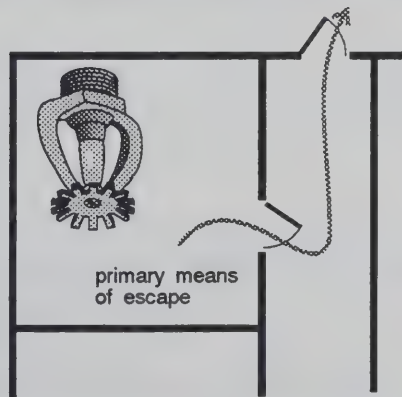


NOT PERMITTED IN ONE- AND TWO-FAMILY DWELLINGS  
BUT PERMITTED IN SMALL BOARD AND CARE HOMES

Exception 1: outside door leading to grade or stairs



Exception 2. If sprinklers, secondary means not required



Smoke Detectors

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common spaces	While the intent is similar, the requirement for smoke detectors in common areas differs somewhat from the requirement for small board and care homes. The one- and two-family dwelling requirements state that the alarm signal from <u>any</u> smoke detector must be heard in <u>all</u> parts of the home, even with ambient noise and with doors closed. [21-3.3.1; 7-6.2.9] In a small single-story house with the bedrooms clustered together, a single smoke detector is often adequate. In contrast, the board and care requirements specify that smoke detectors are required on each floor of the facility, and in common living areas.
sleeping rooms	The dwelling requirements do <u>not</u> require the single station detectors in sleeping rooms. While the <i>Code</i> technically requires sleeping room detectors in small board and care homes, most homes can avoid their installation by using exceptions. [22/23-2.3.4.3] (See page 4-10 of this guide.)

Interior Finishes

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The requirements for one- and two-family dwellings allow interior finishes with A, B, and C ratings. However, unrated finishes (some decorative papers, most carpeting installed on walls, etc.) are prohibited. The *Code* has no requirements for floor finishes for either small board and care homes or one- and two-family dwellings.

# A Brief Guide to Fire Emergency Planning

## The Relationship Between Fire Emergency Planning and *Code* Requirements

### Chapter 31 Requirements

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requirements for  
the written plan

Chapter 31 of the *Code* covers operating features for all types of occupancies. This chapter requires board and care homes to establish an emergency plan with the following features [31-7.1]:

- ☞ The plan must be written and available to all supervisory personnel at all times.
- ☞ The plan must include staff responses that are needed to protect any residents that have “unusual needs.”
- ☞ When any resident who has unusual needs is admitted, the plan must be changed to ensure that the resident is protected.

requirements for training

In addition to the requirements for a written document, there are also requirements covering the content of training for staff and residents [31-7.2]:



- ☞ All employees must be trained to carry out their responsibilities in the plan.
- ☞ The staff must “review” their training at least every two months.
- ☞ All residents who are expected to participate must be trained.
- ☞ Residents must be trained to take appropriate action if the primary escape route is blocked.
- ☞ Residents must be trained to assist each other to the extent that their abilities permit *without additional personal risk*. (italics added)

fire drills

The *Code* imposes requirements for fire drills. For a discussion of these requirements, and other related issues, see the section of this guide (starting on page 3-11) covering administrative issues when fire drills are used determine evacuation capability ratings.

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## Escape and Egress Routes—Use Them or Lose Them

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The *Code* requirement for an alternative means of protecting residents (see Chapter 5 covering Moving People) is of little value where residents have not been trained to use the alternative means of protection. Studies of fires have clearly demonstrated that board and care residents tend to overlook secondary means of escape when they have not used them as part of their fire safety training. Such training is required in order for the means of escape or egress to be counted towards meeting *Code* requirements. Part of the board and care requirements entitled “Acceptability of Means of Egress or Escape” [22/23-1.4] states that, “*No means of escape or means of egress shall be considered as complying with the minimum criteria for acceptance unless emergency evacuation drills are regularly conducted using that route in accordance with the requirements of Section 31-7.3.*” (Italics added; Section 31-7.3 of the *Life Safety Code* covers fire exit drills in board and care homes.)

## Evacuation Capability and Choosing Appropriate Strategies

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Evacuation capability has a direct relationship to emergency planning. A “prompt” facility needs an emergency plan that will reliably get everyone to a point of safety in less than 3 minutes—even in the middle of the night. A “slow” facility has more time (as long as 13 minutes), but the emergency plan should still focus on getting everyone to a point of safety. (For a discussion of the meaning of “point of safety, see page 3-3 of this guide; for a discussion of fire drill times and evacuation capability levels, see page 3-10.)

“Impractical” facilities have more options. These facilities are required to have the fire protection features needed to use the same “defend-in-place” strategy employed by health care facilities — residents will be reasonably safe by remaining in their rooms behind closed doors unless immediately endangered by the fire. However, this strategy is not always the better approach even when a facility meets the requirements for an impractical-to-evacuate level of evacuation capability. Outside is the safest place to be in any fire, so every resident who can safely leave should be trained to evacuate the building. Leaving the building is certainly the better strategy for those residents who can not be trusted to stay in their rooms with the door closed for the duration of a fire emergency.

## Six Steps to an Excellent Emergency Plan

### Step 1. Find the Best Strategies for the Particular Board and Care Facility.

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primary and  
backup strategies

Chapter 5 of this guide, which covers moving people to safer locations, explains the *Code* requirements for having an alternative to evacuating using the primary route of escape or egress. The plan needs to include such a backup strategy for each and every resident. The best alternative means of protection can vary within a single facility depending on the abilities of

residents and the location of their sleeping rooms. For example, a small prompt facility might have both operable windows and 20-minute barriers separating sleeping rooms from hallways. Using a ground floor window might be the best backup strategy for one resident who can climb out unassisted, but staying by the window inside the room might be the best backup strategy for another resident who is unable to do so.

board and care plans usually differ from health care plans

Health care facilities typically train only the staff to respond to emergencies. Many patients might be unable to evacuate unassisted, even if they were to receive training. Instead, patients are usually protected inside their rooms, and are not supposed to evacuate without hands-on assistance. Therefore, patients do not need to participate in fire exit drills.

The situation in most board and care homes is different. Board and care homes that only meet the requirements for prompt and slow evacuation capability levels are not designed to protect residents inside of sleeping rooms for an indefinite amount of time. (Residents can be trained to stay in their rooms if the escape route is blocked, because they can be rescued soon afterwards by arriving fire fighters.) Therefore, residents must participate in fire drills so that they will leave the building quickly, with as little help as possible.

#### WARNING:

##### A Good Plan In the Wrong Building Can Kill

Make sure that the plan used in a board and care home is appropriate for its level of evacuation capability. A plan that is appropriate for a home with an impractical level of evacuation capability might have a higher level of safety using the defend-in-place strategy commonly employed in health care facilities. However, this approach can be tragically inadequate in a board and care home with a prompt or slow evacuation capability

rating. For example, board and care residents have died in a facility that met *Code* requirements for prompt facilities because they were not trained to evacuate. The facility trained only the staff because “that’s the way it’s done in health care facilities.” This fire killed high functioning residents who probably would have survived, if they had been trained to immediately evacuate the building when the fire alarm sounded.



## Step 2. Analyze the Assistance Needs of Each Resident.

helping residents  
is consistent with  
the evacuation  
capability approach

Other regulatory approaches often rely on concepts such as “capable of self-preservation,” and “mobile.” (See page 3-2 for another discussion of this topic.) These approaches encourage staff members to ignore potential problems, because if problems are identified, then residents can be forced to move from their home. In contrast, the evacuation capability approach looks at how quickly a board and care home can evacuate as a group. It recognizes that trained staff can be relied on to help residents during a fire emergency. For this approach to work as well as possible, staff members must know what to expect. They must figure out what type of help might be needed by each resident.

use Evacuation Capability  
Determination as a tool

Evacuation Capability Determination (ECD) is a valuable tool for conducting a comprehensive review of each resident’s possible assistance needs, even if it isn’t being used to establish evacuation capability levels. (The ECD is discussed in Chapter 3 covering evacuation capability.) For each risk factor, there are specific examples of behavior that will help staff members identify potential problems that they might otherwise ignore.

### Examples of Residents’ Assistance Needs from the Evacuation Capability Determination Method

- ✓ The resident needs two persons to get into a wheelchair.
- ✓ The resident sometimes forgets instructions after a brief period of time.
- ✓ The resident spends an excessive amount of time preparing to leave (for example, getting dressed, seeing what everyone else is doing).
- ✓ The resident has been trained to stay [at a designated location after evacuating], but has failed to demonstrate this capability in three of the last four fire drills.

pay extra attention to  
late night problems

Fires that start after people have gone to bed are far more likely to cause casualties. In addition to the delay caused by having to wake up, many problems can occur that are easily overlooked unless extra attention is paid.

**Examples of Late Night Assistance Needs  
from the Evacuation Capability Determination Method**

- ✓ Medication taken before retiring differs in type or amount (increased) from the medication taken during waking hours.
- ✓ The resident has a readily apparent hearing impairment or the resident removes his or her hearing aid when sleeping.
- ✓ There is some specific evidence that the resident may be an exceptionally sound sleeper.
- ✓ The resident is generally capable of following instructions except that the resident is sometimes groggy and may fail to listen carefully or follow through with instructions.

**Step 3. Analyze How to Provide the Assistance Needed by Each Resident.**

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maintain a list of  
potential assistance needs

Simply listing resident assistance needs, and periodically updating the list, can be extremely helpful to staff members for two reasons:

- ☞ During a fire emergency, they will be on the lookout for the types of problems on the list.
- ☞ Once a list of assistance needs has been developed, the staff members can use the list to figure out any needed extra measures. For example, visual alarm lights, fans, or devices that vibrate beds can be installed in the sleeping rooms of residents who may not awaken to the sound of an alarm. Brighter lighting can be installed so that a resident with a sight impairment can safely walk down the front steps without assistance. A sign or flag can be used so that residents will remember the designated meeting place outside the building.

write policy so that  
staff members know what  
they are expected to do  
in an emergency

Staff should know exactly what is expected from them during an emergency. They need to know that they are expected to assist residents, but that they are not expected to do so if conditions pose an immediate threat to their own lives. (Staff members are very unlikely to face immediate danger in a board and care home that complies with *Code* requirements and that has practiced an appropriate emergency plan.)

#### Step 4. Set Performance Goals.

Having a clear goal is a proven motivator. Many programs establish specific goals for board and care residents, and the approach works just as well for fire emergency planning. (Chapter 31 requires that fire safety training be a part of any program of rehabilitation or habilitation provided to residents. [31-7.2]) Sometimes goals can be set for individual residents (for example, opening a door slowly to check conditions on the other side). But other goals are best set for residents and staff as a group (for example, totally emptying a building in three minutes). A few examples of goals are:

- ☞ Meeting a time limit to reach the designated point of safety.
- ☞ Staying at the point of safety until receiving permission to leave from a staff member.
- ☞ Using the appropriate backup strategy every time that the primary escape or egress route is not available. (Use a sign to block the primary route or a hair dryer to heat a door knob.)

#### Step 5. Practice the Emergency Procedures.

why hands-on  
training is necessary

All the material in the emergency plan involving actions by staff and residents should be practiced. Limiting training to distributing and discussing a written fire emergency plan is insufficient for several reasons:

- ☞ Having people actually perform the required behaviors is a far more effective and efficient method for learning procedures, and especially remembering them in the stress of a fire emergency.
- ☞ Staff may not study the materials to a degree that will ensure that procedures will be remembered.
- ☞ The verbal skills of residents may not be good enough to understand explanations of procedures.



- ☞ Training provides social interaction that stimulates interest and learning, and provides the opportunity for questions.
- ☞ Training provides performance feedback that helps persons responsible for emergency planning improve their training efforts.
- ☞ Training can alleviate fears and apprehensions by giving residents and staff full explanations of how their actions will help ensure their safety during a fire emergency.

use different types of practice

Board and care homes sometimes rely too much on one type of fire drill to practice procedures. (For a discussion of the merits of surprise versus announced drills, see page 3-11 of this guide.) The same variety of methods used to teach residents skills in other areas can be applied to fire safety training. (In fact, Chapter 31 requires that fire safety training be a part of any program of rehabilitation or habilitation provided to residents. [31-7.2]) If a resident needs to practice a procedure to reach a level of proficiency, the procedure can be practiced separately from fire drills. In this way, the training for each resident can be tailored so that he or she can achieve the highest level of self-sufficiency and lowest level of risk from fire.

avoid wasting people's time

Fire safety training is often considered to be a nuisance by staff and residents. There are two common causes.

- ☞ **Participants already know the procedures to a high level of proficiency.** If this is the case, then examine your policies to find out whether some training can be eliminated for some people. Also examine whether staff members' and residents' roles can be changed so that they are more challenged or have greater responsibility.
- ☞ **Participants do not understand the relationship between the procedures and safety.** Residents may fail to understand the reason for procedures unless they are carefully explained. Training materials such as videotapes are often very helpful. Staff members and residents (to the extent possible) should understand how fire pro-

tection features support procedures. (Use this guide to help explain the purpose of fire safety features.) For example, if residents are expected to wait in their rooms when the primary escape route is blocked, then staff and capable residents should understand that the building has features (fire-rated barriers, sprinklers, etc.) that make this a relatively safe procedure.

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## Step 6. Evaluate Performance.

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provide feedback  
about performance

Goals are great motivators, but they are of little value unless feedback is provided to let participants, both staff and residents, know how well they are doing. Staff members should meet to discuss any problems in meeting the performance goals, and how these problems can be overcome. In their interactions with residents, board and care home staff should never reflect the attitude that fire drills are only conducted as a means of satisfying regulatory requirements. Staff can often apply to fire safety training the same types of reinforcers that motivate residents to achieve their goals for achieving daily living skills.

analyze the appropriateness  
of strategies and procedures

Board and care homes are too often content to simply run a fire drill without ever meeting afterwards to discuss how well it went. Staff, and residents as appropriate, should meet after drills to discuss problems and opportunities. If a procedure or strategy is not working well, then they should try to solve the problem. The written plan should be updated to reflect changes.





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